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

"Why do I have to learn this?" "When am I ever going to use this?" Math teachers of 6th-10th grade students constantly answer questions like these.

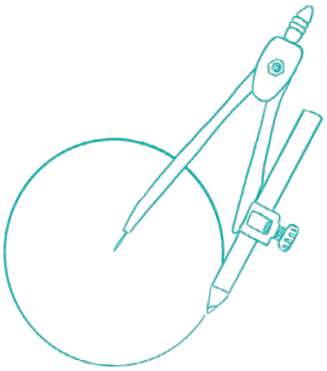
Students report feeling frustrated, confused, and stuck more often as math starts to feel harder to learn. Helping students to connect the dots on how learning higher-level math is useful to their lives and futures is critical to their willingness to stay engaged and motivated, particularly at the levels of algebra and above.

Yet, many students don't see the utility or relevance of higher-level math.

Unfortunately, the most common ways that adults (including teachers and parents) talk to them about the usefulness of higher-level math are not credible, and in some cases, even feel discouraging.

To help students to connect the dots on how higher-level math is useful to their lives and futures, and to keep students engaged and motivated, the Math Narrative Project tested a wide range of messaging among students, teachers, and parents.

After all, for this messaging to be effective with students in ways that impact their beliefs and behavior, it also has to be credible to the parents and teachers who are delivering these messages to students.



On the following pages, you will find:

- ***Effective Messaging Themes***
- ***Examples of Effective Messaging***
- ***Examples of Messaging that Falls Flat***

Effective Messaging Themes

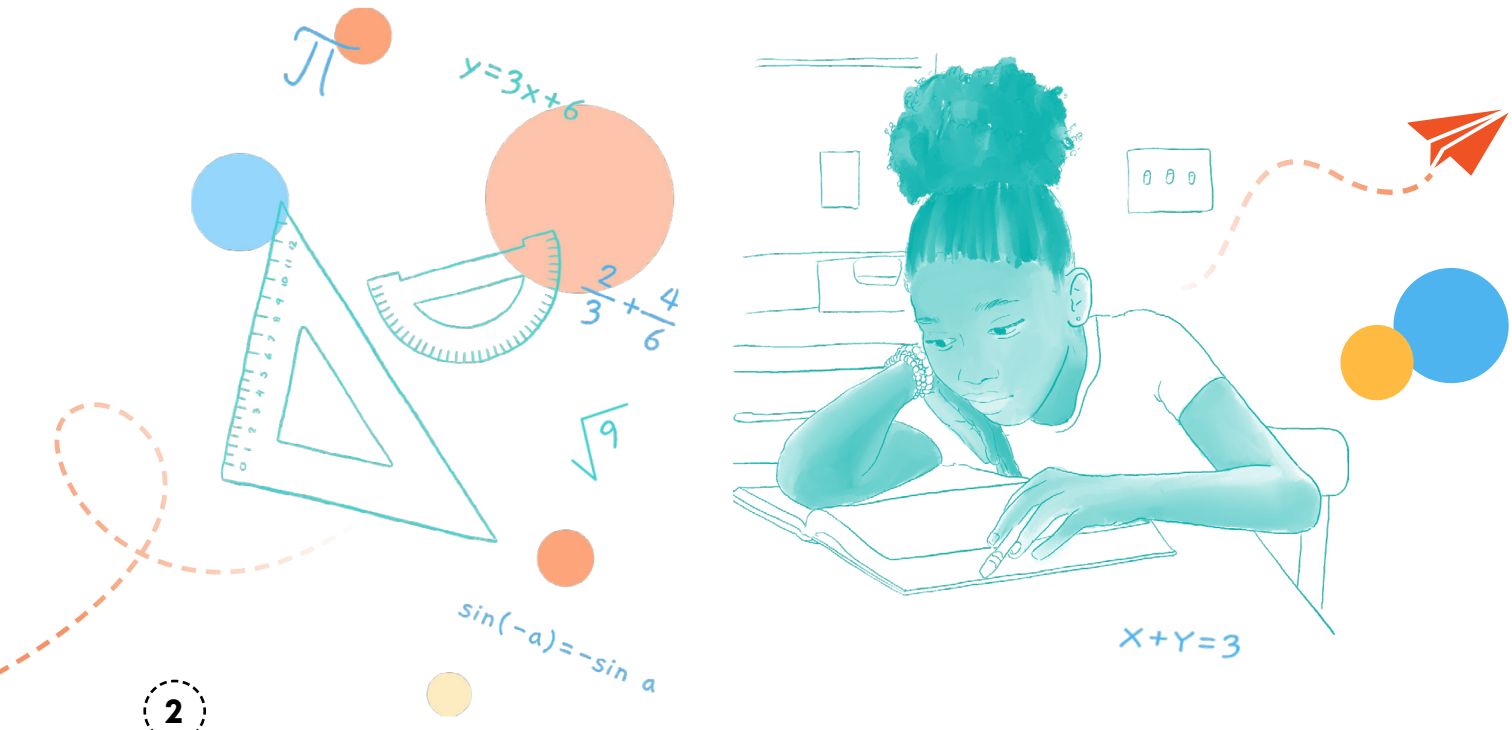
The following messaging themes are credible to different types of students and feel directly relevant to many of the students' own lives. In general, messages showing students how higher-level math supports their ability to have a good life are empowering and motivating. This is especially effective when it aligns with how students express their own desire for a good life, including being able to have the skills and opportunities to have a stable income and financial security to support themselves and their families.

These messaging themes can serve as a structure to help you develop your own messaging. A mix of messaging rooted in these themes will reach and motivate a broad range of 6-10th graders.

- **The Power to Shape Your Future |** Frame learning higher-level math as a way for students to have more independence in their lives and the power to shape their own future, rather than framing the lack of higher-level math knowledge as a barrier that limits their potential.

- **Open Pathways to a Good Life |** Show students how learning higher-level math is connected to their own interests (e.g., making money, having more job options, improving their community) and opens more pathways for the life they want to live. At this age, the desire for a good life is rarely tied to specific career paths, so showing students that higher-level math can open the door to more options in their future is motivating.

- **Be Ready for the Real World |** Tie higher-level math to skills that support students' independence and ability to navigate the world in adulthood, including making informed financial decisions, spotting and avoiding scams, and understanding the implications of data in the news.



Examples of Effective Messaging

The following are various messages tested in the research. They provide different and concrete examples of how learning higher-level math is useful and relevant to students. Since students have a range of priorities and interests, one example may work well for some students and not for others. For example, students who play video games may be interested in learning whether buying or renting a video game is better. Students who are interested in cooking or baking may be interested in learning how to adjust recipes. This is why it is important—and effective—to use a mix of different concrete examples rather than trying to use a vaguer, one-size-fits-all reason to learn higher-level math. Together, these different messages resonate with and motivate a broad range of students.

Type of Effective Message	Example of Message Tested with Students
Higher-level math can help you "pivot" in your career. If, as an adult, you find yourself in a job you don't like, having learned higher-level math can **give you more options to pursue a wider range of careers.**	"In school, you can always try out something new like an elective, a club, or afterschool activity. When you're an adult, a 'pivot' into a new job can be a little harder. Having higher-level math skills like algebra will make it easier to change jobs or enter a new career if and when you need to. Not every job will require you to do algebra, but a lot of employers want to know that you learned it at some point. It helps you get a foot in the door to cool new opportunities."
Higher-level math like algebra helps you **become financially literate or make better financial decisions.**	"If you need to buy a new phone, you might need to figure out if it makes more sense to pay it all at once with cash, or pay a fee each month to buy the phone over time. Plus calculate how many hours you'd need to work to afford it." "A lot of video games have the option to rent or buy. With algebra you can figure out if it is worth paying to rent a video game each time you play or to buy it for a larger amount if you play it a lot."
Higher-level math can help you understand how to **assess and choose between loan options to buy a car, a house, or other big purchases** as an adult.	"At some point in your life you might need to take out a loan in order to get what you want. This might be when you are a teenager and you need to take out a loan to help pay for college, or when you're an adult, and you want to buy a car or a house. In algebra, you learn how compound interest works and you will need this to understand how much money you need to borrow, how much in interest the different banks would charge you, and how much time it will take you to pay off the loan."
Higher-level math can help you **protect yourself and your family** by making you better able to **recognize scams and companies that want to take advantage of you or your family**.	"Some companies target Black, Hispanic, and communities without a lot of money and try to charge really high interest rates (payday loans). But if you understand higher-level math, you can make sure you and your family are not getting cheated or taken advantage of. Protecting your community can look like watching out for businesses that don't have your best interest in mind. Understanding algebra makes you more able to do this and help your friends and family."

Examples of Messaging that Falls Flat

As you develop your own messages, it is also helpful to know more about the kinds of messages that fall flat with students. Extensive research conducted among students shows that messages are less likely to be credible and compelling when they:

- **Are too abstract |** Messages about the value of math as a universal language or the beauty of mathematics may inspire students who are already interested in math and feel confident in their math skills. However, students who feel that they are struggling in math need more specific examples of how higher-level math relates to their own lives or futures.

- **Focus on obstacles |** Telling students that they will not be able to graduate high school, get into college, or get a good job without learning higher-level math feels discouraging—especially for students who are struggling with math. Without specific examples connecting how learning higher-level math is useful to them and providing positive motivation, many are left thinking that these requirements are unfair obstacles to a good life—ones that they cannot overcome.

- **Disregard students' current beliefs about jobs requiring higher-level math |** Showing students the many different jobs that require higher-level math triggers skepticism. Many students in grades 6-10 believe that only a few specialized STEM jobs, like engineering, require higher-level math like algebra or geometry. They think that apps, computer programs, or calculators can do any math required for the vast majority of fields, so they don't need to know how to do it themselves. This belief is reinforced when they hear from parents or other adults in their lives that most jobs do not require higher-level math. When messaging—such as that math is required for many more jobs than they think—is in stark opposition with what students believe to be true, they reject it. In addition, for students who are struggling in math, being told that a large portion of jobs require knowing higher-level math is discouraging rather than motivating. Since they feel they cannot master higher-level math, they conclude that many more doors are closed to them.

Example of Less Effective Message	Why Students Report This as Demotivating or Not Credible
"Math is a universal language."	Students think of language as a way of communicating (e.g., Spanish, Japanese, French). Therefore, students often find this metaphor confusing because they don't see math in the same category as those other languages.
"Math helps you build critical-thinking skills."	Students don't believe that math is the only way to learn critical thinking skills. Many believe they can also develop those skills learning other subjects which often feel easier and more connected to their own lives.
"You just have to get through higher-level math so that you can graduate from high school or get into college."	Examples that diminish the role and power students have in their own life and future—or messages that are too negative and focused on obstacles—are often demotivating and can make students feel they are being put upon. This includes messages that imply things like how it "may not be fair, but you just have to get through it."
"All careers use higher-level math, or you will need higher-level math in your life generally."	Students have a diversity of life and career goals. Many students believe that this is either not the case or that the jobs/careers they aspire to will depend more on knowing how to use a tool (e.g., apps, technology platform) than how to do the underlying math.