GSG
GLOBAL STRATEGY GROUP

The Need to Make Math More Relevant and Engaging for K-12 Students

Supported by:

BILL & MELINDA GATES *foundation*

Objectives

- To understand how parents and teachers in the U.S. think about the state of math education today – what's working, what isn't, and what would they want to see changed?
- To gauge which skills parents and teachers believe are most important to develop through math education.
- To understand how parents and teachers want students to experience math in the classroom, including which tools and approaches they think would be most likely to lead to student success in math.

Overview of the Research

July 2022

Getting the lay of the land from insiders

11 in-depth interviews with experts in math curriculum design, implementation, and/or professional learning supports, including school- and district-level administrators

August 2022

Understanding the parent and teacher perspective on math education today

Qualitative online journals among the following, all nationwide:

- 20 white parents of K-12 students
- 21 parents of color of K-12 students
- 29 K-12 math teachers

October 2022

Digging in further with key audiences

11 online focus groups among K-12 math teachers and parents of K-12 students in Gates Foundation K-12 focus states: California, Florida, New York, and Texas

December 2022

Getting a reliable quantitative read on the problem and desired solutions

Large-scale survey among 1,507 adults, 805 parents, and 732 teachers nationwide, with oversamples in focus states (CA, FL, NY, TX) and among parents of color (Latino, AAPI, and Black parents)

<u>The Problem</u>: Math education is perceived as unengaging, outdated, and disconnected from the real world. Therefore, students are not interested in what they are learning and are not getting the adequate preparation they need to succeed later in life.

"It is necessary to update the school curriculum or our society will feel the impacts of this over time. Using mathematics as an example, the input of mathematics used in computer science, statistical programming, or quantitative reasoning means if we do not adjust the curriculum accordingly, we will not be training students for the current market and we will feel the impact as a whole. It will be as if we are stuck on time, not progressing, not developing new ideas, and not allowing students to grow their intellect." – FL Parent, white

"I think Tana's math education falls short maybe in the area of interest. Math is often looked at as a chore, instead of a challenge." – AZ Parent, white

"Technology is advancing and we need to educate the future children in what the world is heading towards: more jobs/careers that have computer science, coding, and statistics that help us to better understand the world, to be able to provide a solution." – OR Parent, Latino

"The biggest problem with the way math is taught today is that it does not reach all students. The most important way that math instruction needs to change is to make it relevant, more real-world scenarios. Some of the more traditional math instruction is not preparing a lot of students for life after school including jobs. Changing the way math is taught today will prepare our children for success in this changing world." –TX Parent, Black

The Solution: Make math education more relevant and engaging so that more students will succeed in math and, thus, later in life

"For most students, math is a boring subject. If they don't get it, they get turned off; they don't want to deal with it. But if something is engaging and bringing them happiness and something that they can relate to, I believe that they can be more successful in math." – *FL Parent, Latino*

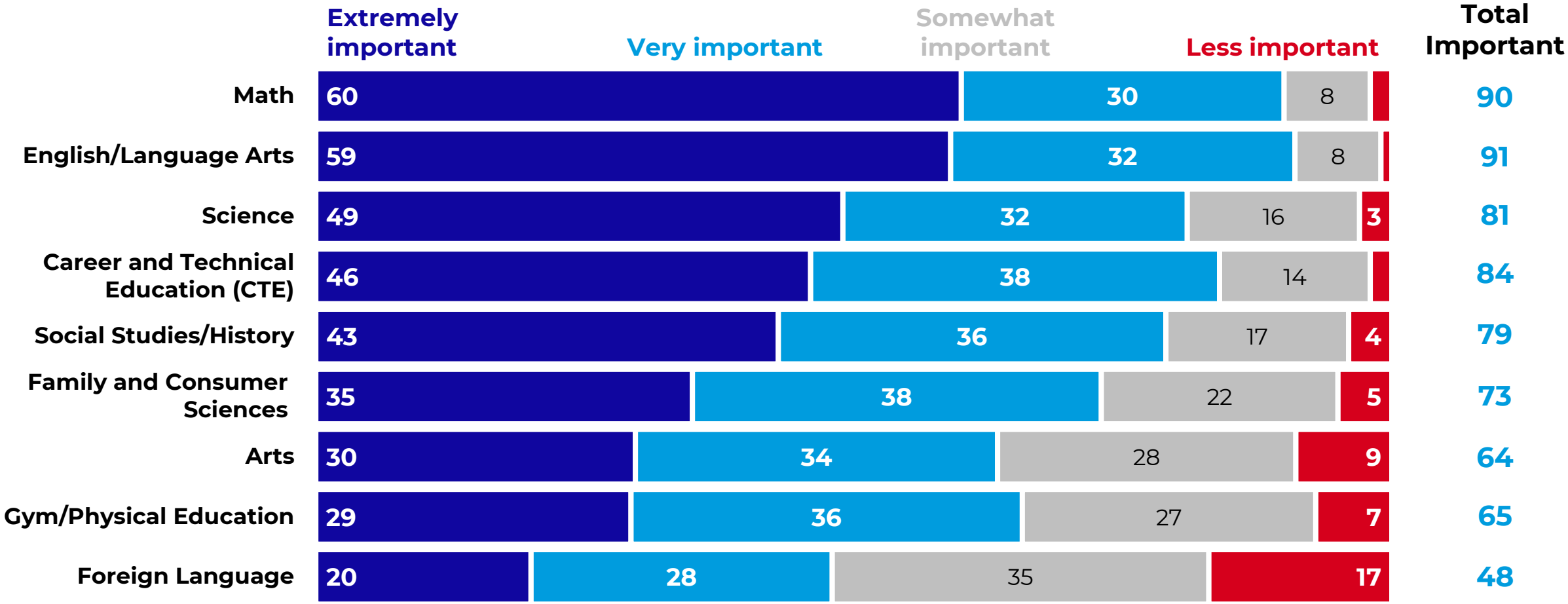
"I enjoy math, but it's not necessarily the most glamorous of subjects. If you can make it more interesting, you can make it more engaging. That will get kids more interested in it, more excited in it; wanting to learn more about it. That gives them the better chance for success down the road because then they're willing to learn versus seeing it as a chore or bore." – *FL Parent, white*

"Make people think of math not as a hurdle to jump, but something everyone should be strong with in their own way." – *CA Parent, Latino*

"[Math] definitely needs to be practical and applicable to the real world… it definitely makes students better problem solvers and thinkers if they're interested in it; that's why we need to keep kids interested and find different ways to go about it." – *TX Parent, white*

Math, along with English/Language Arts, is identified as the most important subject that students take

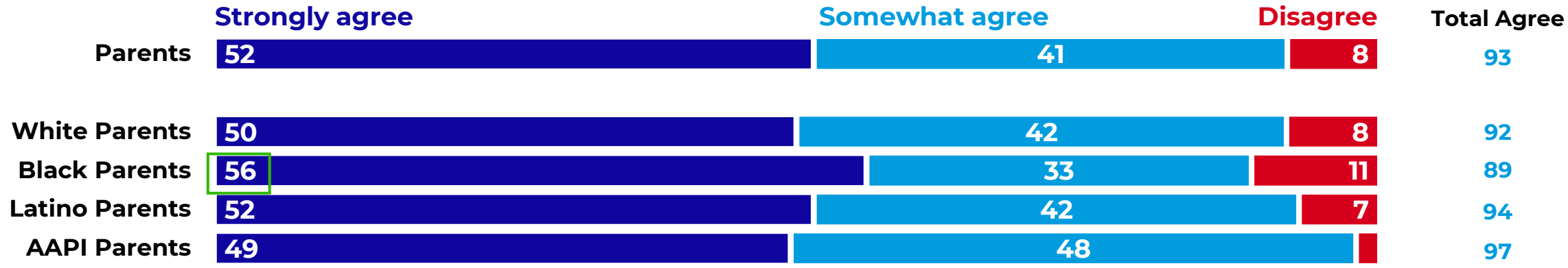
Importance of Academic Subjects: *Among U.S. Adults*



Success in math class is perceived as important not just for its own sake, but because it portends success later in life

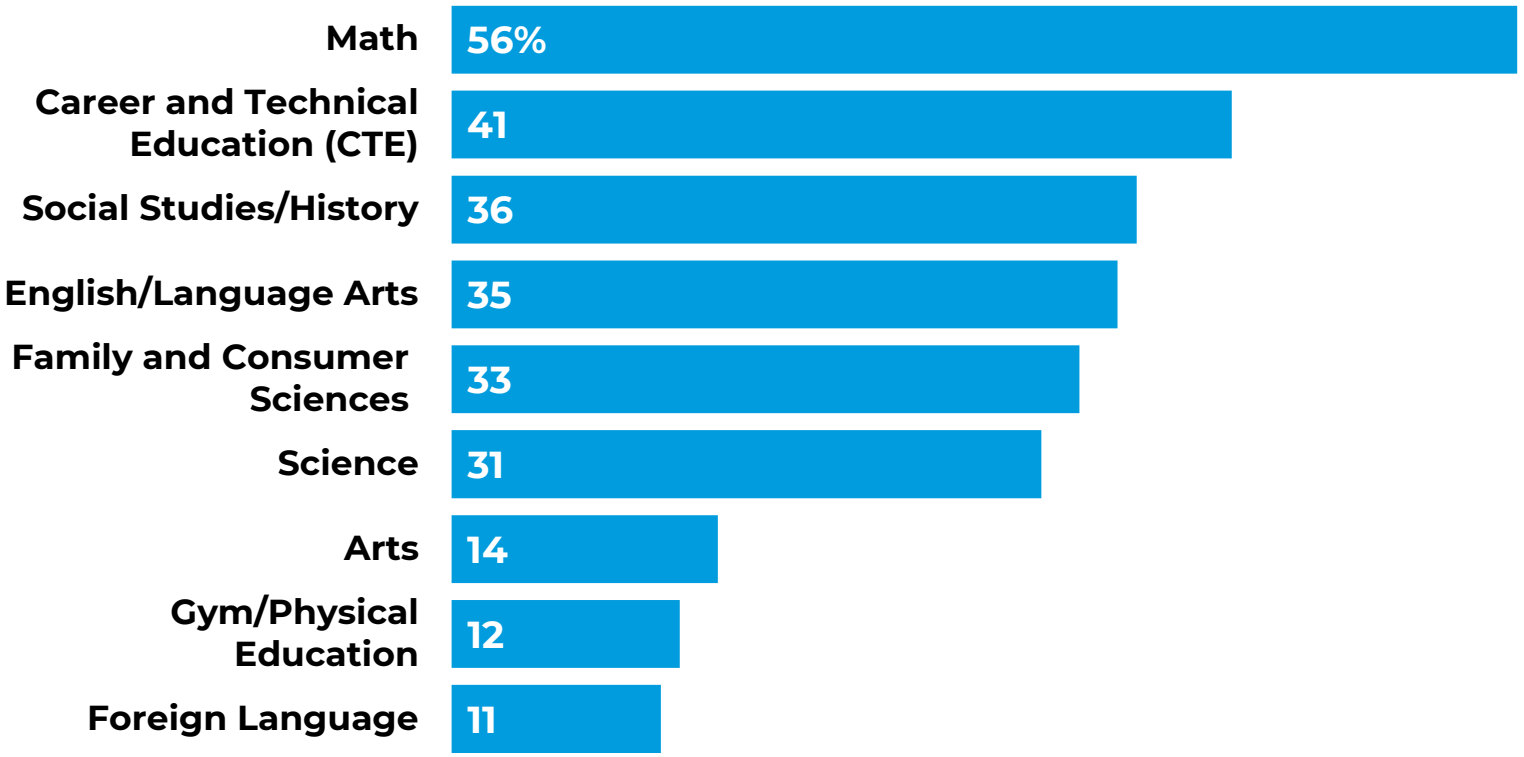
When students succeed in math, they are more likely to succeed later in life:

If my child succeeds in math, they are more likely to succeed later in life:



At the same time, math is identified as the subject most in need of updating and improvement in terms of the way it is taught

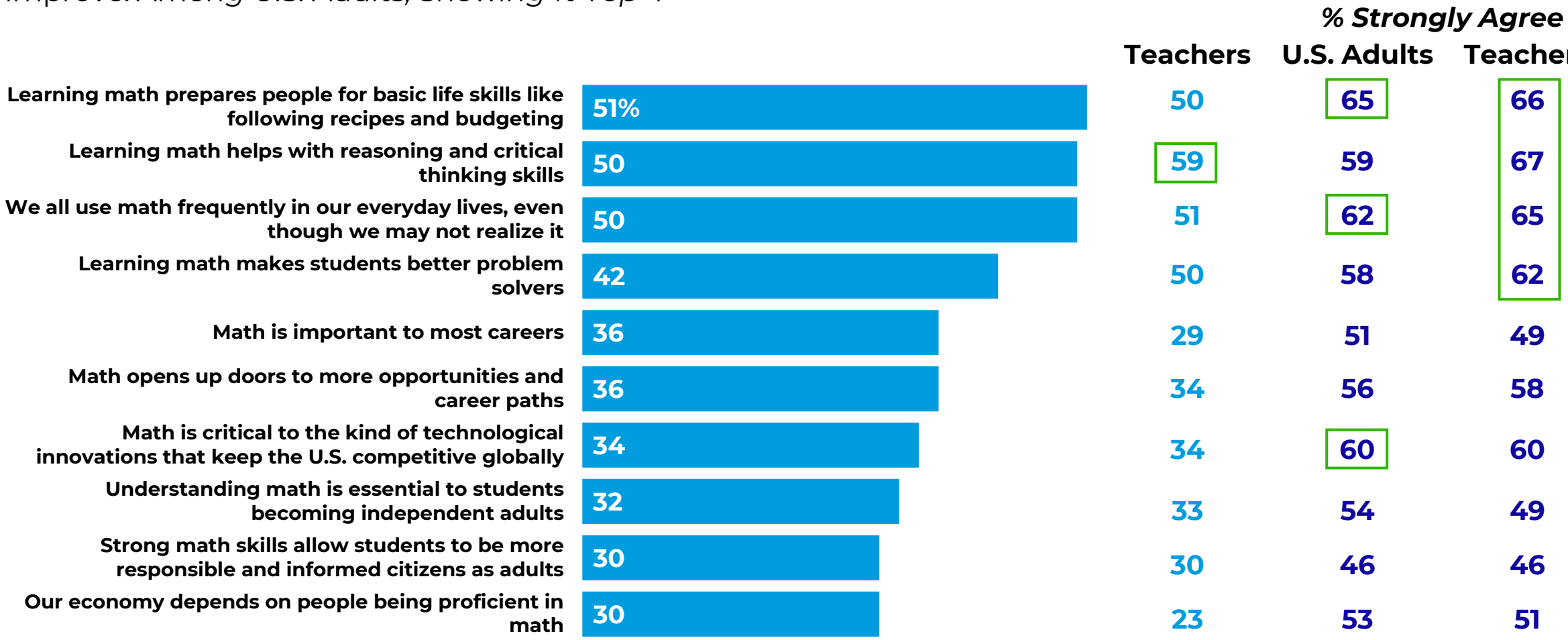
Which two or three of the following academic subjects are most in need of updating and improvement in terms of the way they are taught?
Among U.S. Adults



	Parents					
	White	Black	Latino	AAPI	Teachers	Math Teachers
Math	54	57	62	66	51	60
Career and Technical Education (CTE)	39	28	42	36	36	36
Social Studies/History	33	42	31	35	36	30
English/Language Arts	36	40	30	36	43	43
Family and Consumer Sciences	31	24	27	19	32	36
Science	31	30	29	39	29	34
Arts	15	18	20	14	14	10
Gym/Physical Education	12	15	10	6	14	11
Foreign Language	13	13	15	22	12	12

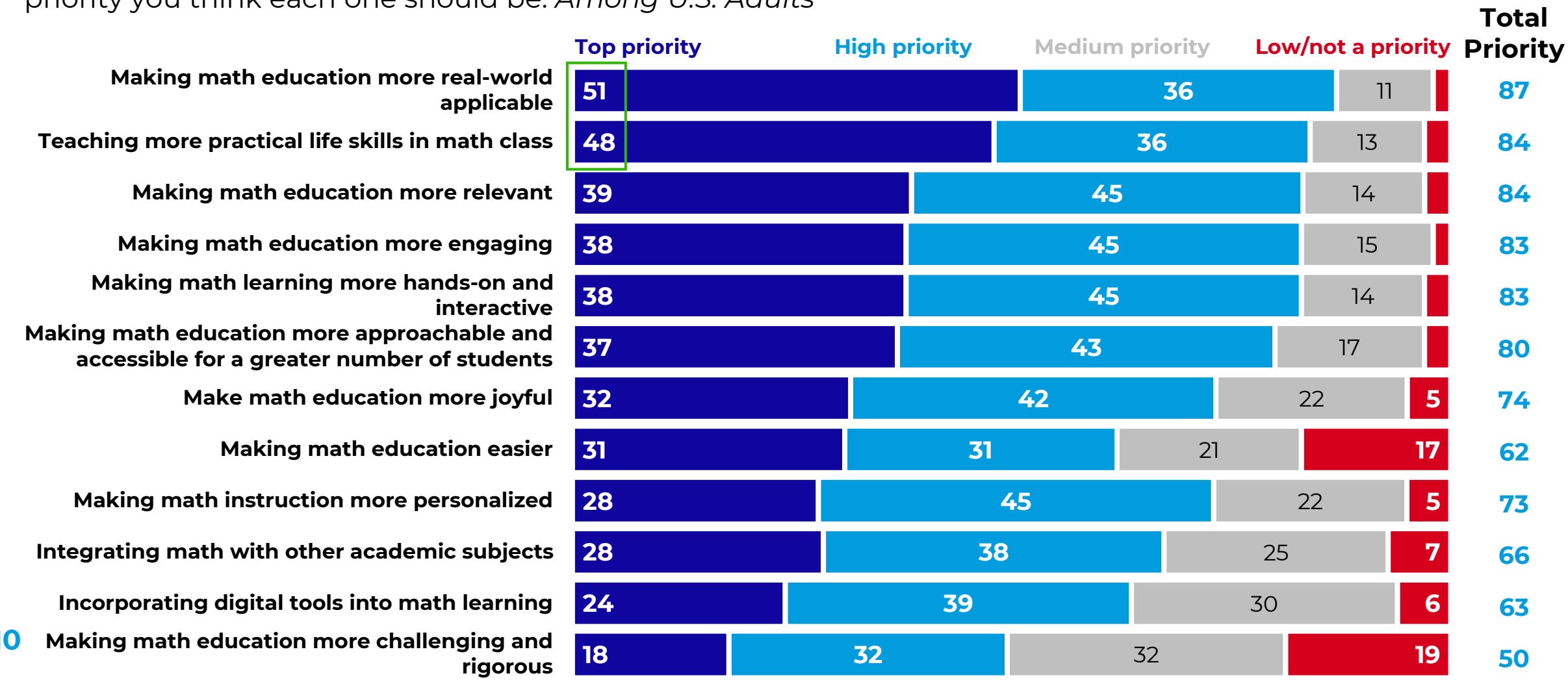
While basic life skills matter, the public and especially teachers feel that learning math is important because it helps students become better critical thinkers and problem solvers

Rank the four that are most important to you personally as you think about why math education needs to improve: *Among U.S. Adults, Showing % Top 4*



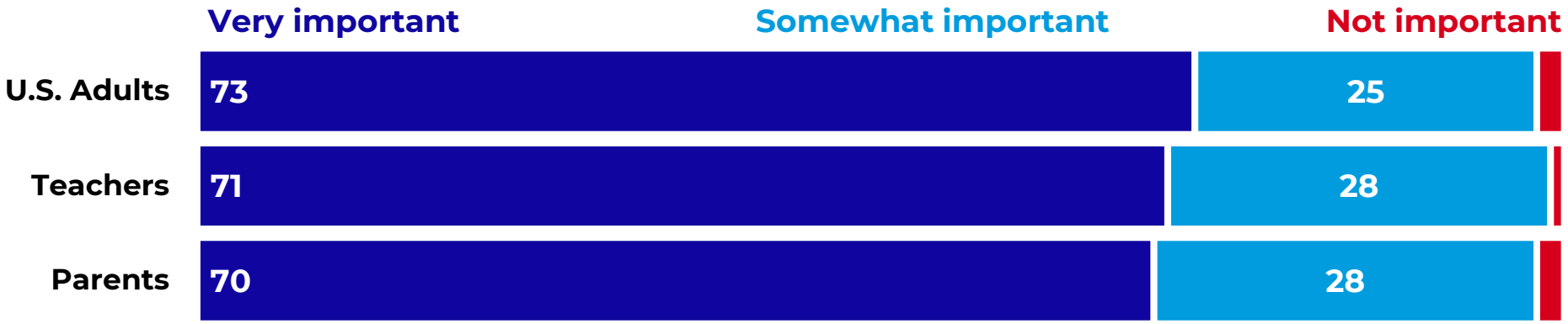
When it comes to math education, making instruction more real-world relevant is the public's top priority

Below are some ideas people have suggested for improving K-12 math education. Please rate how high a priority you think each one should be: *Among U.S. Adults*

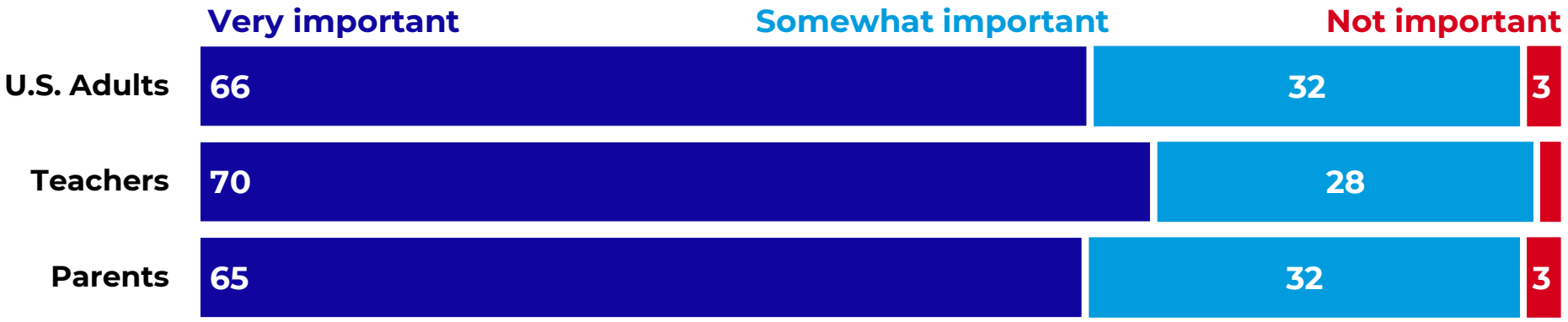


“Real-world applicability” means more to people than just teaching basic tasks like tipping or budgeting. It’s about giving students the *deeper critical thinking skills* necessary for success.

How important do you think math is for preparing students for the real world?

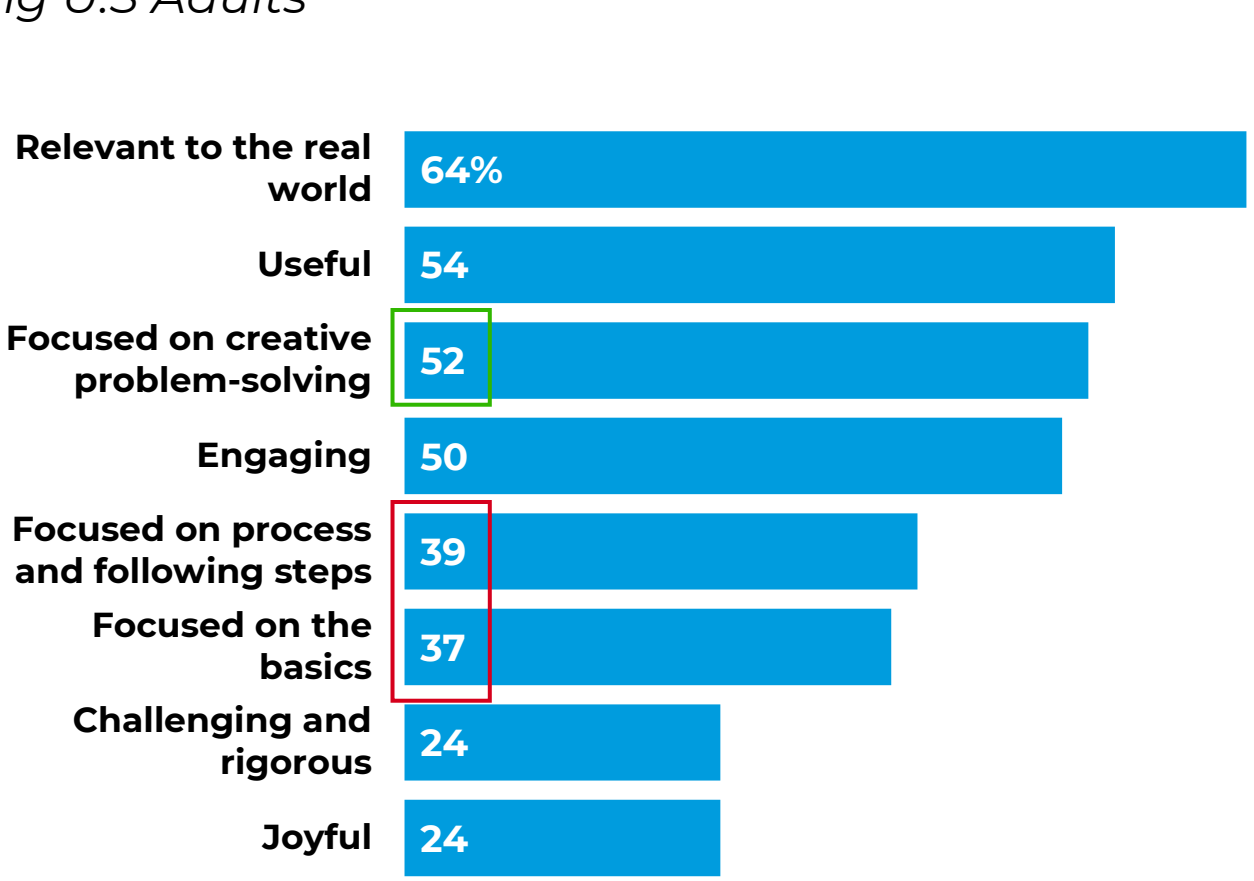


How important do you think math is for developing skills that are used in the real world like reasoning and critical thinking?



“Relevant,” “useful,” and “engaging” emerge as top attributes for what math education ideally should be like. Creative problem solving is seen as more important than just following steps or teaching the “basics.”

Which of the following best describe what you think K-12 math education should *ideally* be like?*
Among U.S Adults

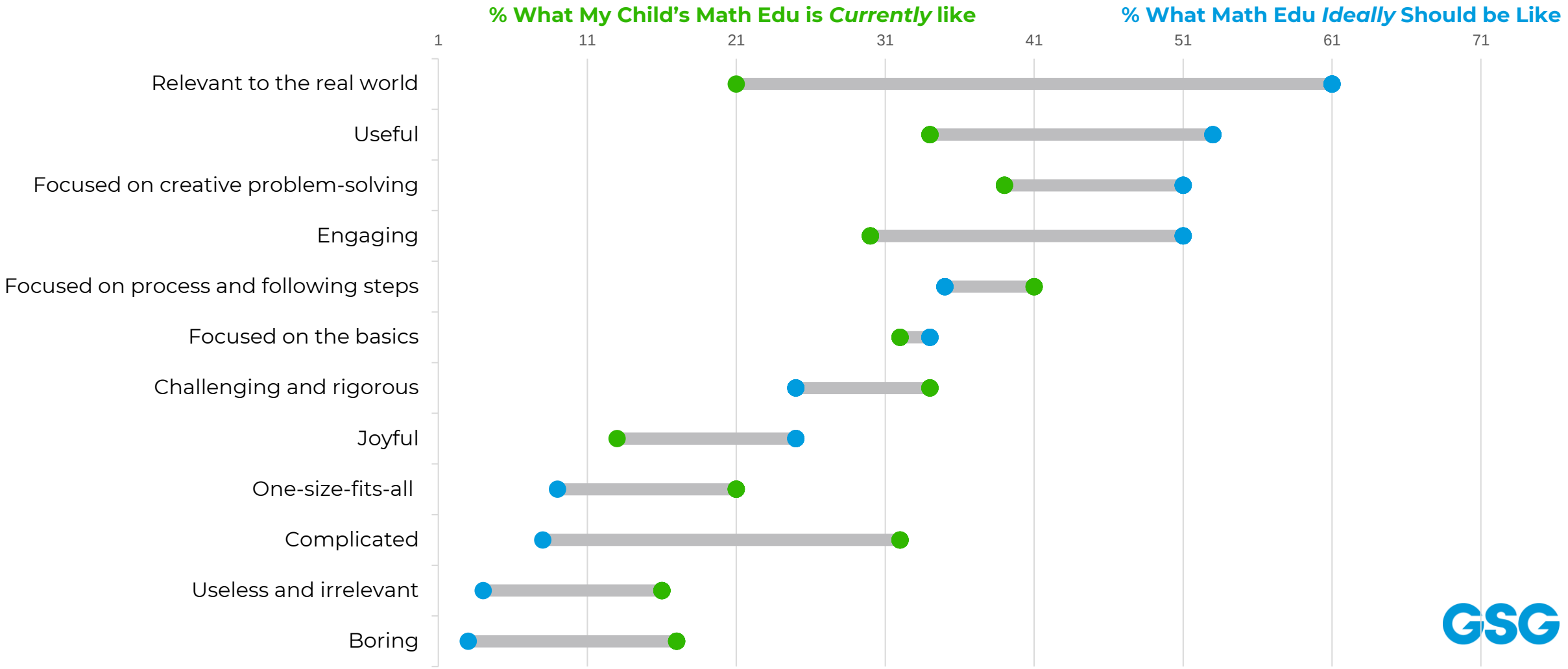


	Parents					
	White	Black	Latino	AAPI	Teachers	Math Teachers
Relevant to the real world	64	62	52	62	69	70
Useful	57	43	45	49	50	52
Focused on creative problem-solving	53	41	49	56	58	63
Engaging	53	47	51	47	54	59
Focused on process and following steps	35	31	35	37	31	30
Focused on the basics	32	39	37	30	33	32
Challenging and rigorous	24	22	29	37	36	37
Joyful	24	34	30	17	20	20

*Showing top responses; respondents chose up to four from a list of twelve descriptors

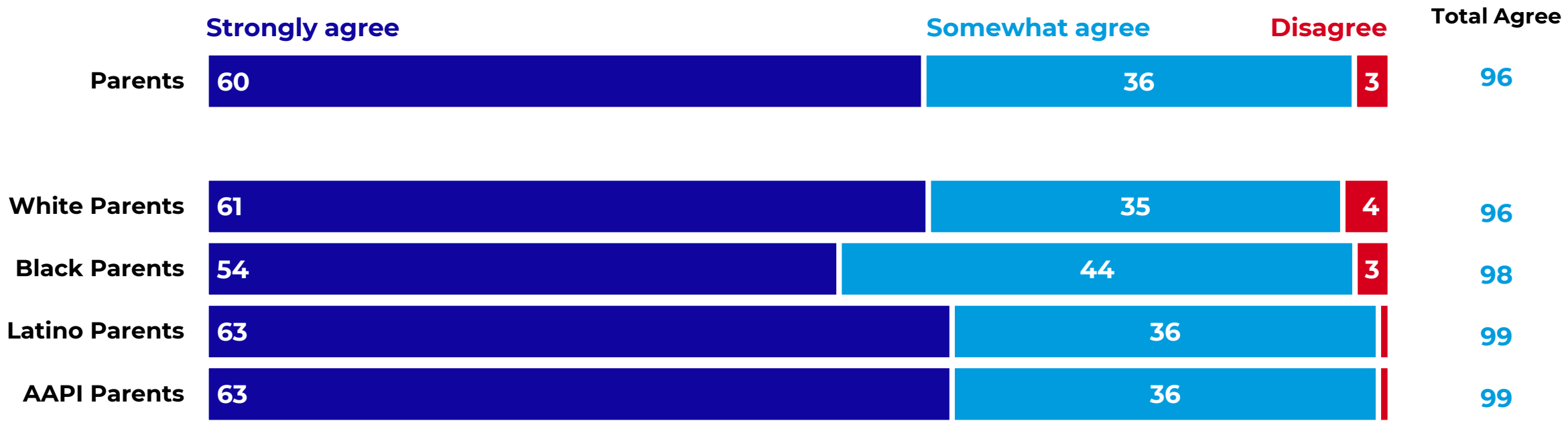
Among parents, the largest gaps between what math education *ideally* should be like and what their child's math education *actually* is like are on being "relevant to the real world," "engaging," and "useful"

Please choose up to four that best describe...

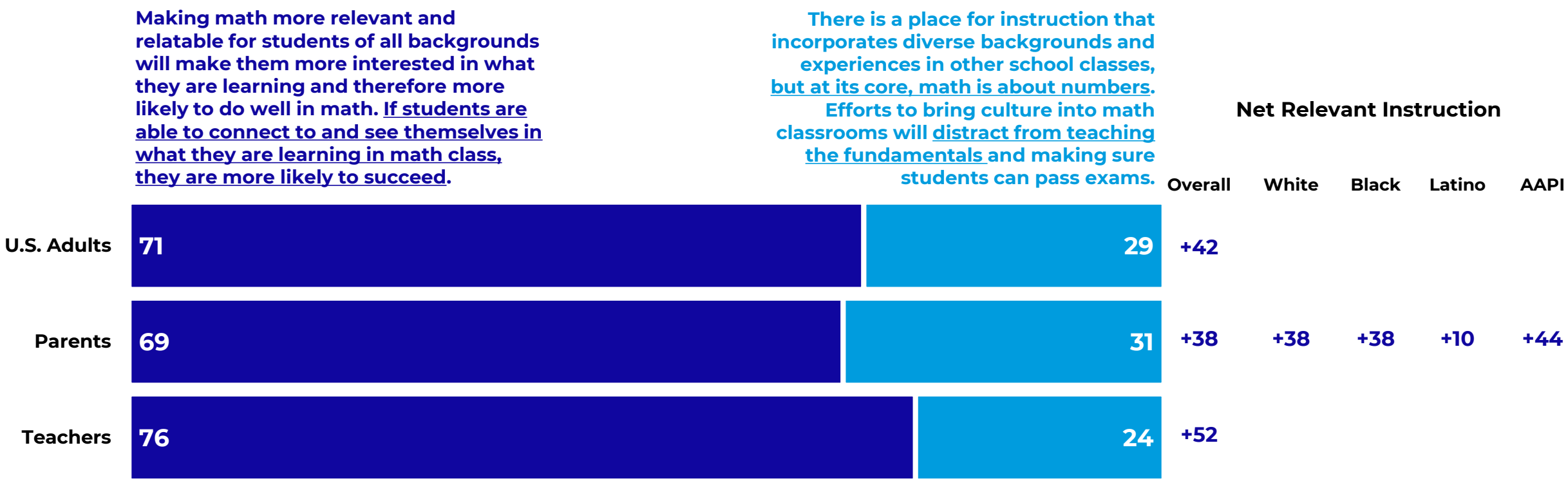


Parents across groups feel that their own child would be more likely to excel in math class if it felt more relevant and engaging

Making math education more relevant and engaging will make it more likely that my child succeeds in math:



Large majorities are inclined to believe that making math education more personally relevant and relatable for students of different backgrounds will make it more likely that they succeed in math class



Teachers and parents see elementary school as critical in laying a strong foundation, but believe that math can and should become both deeper and more customizable as students get older

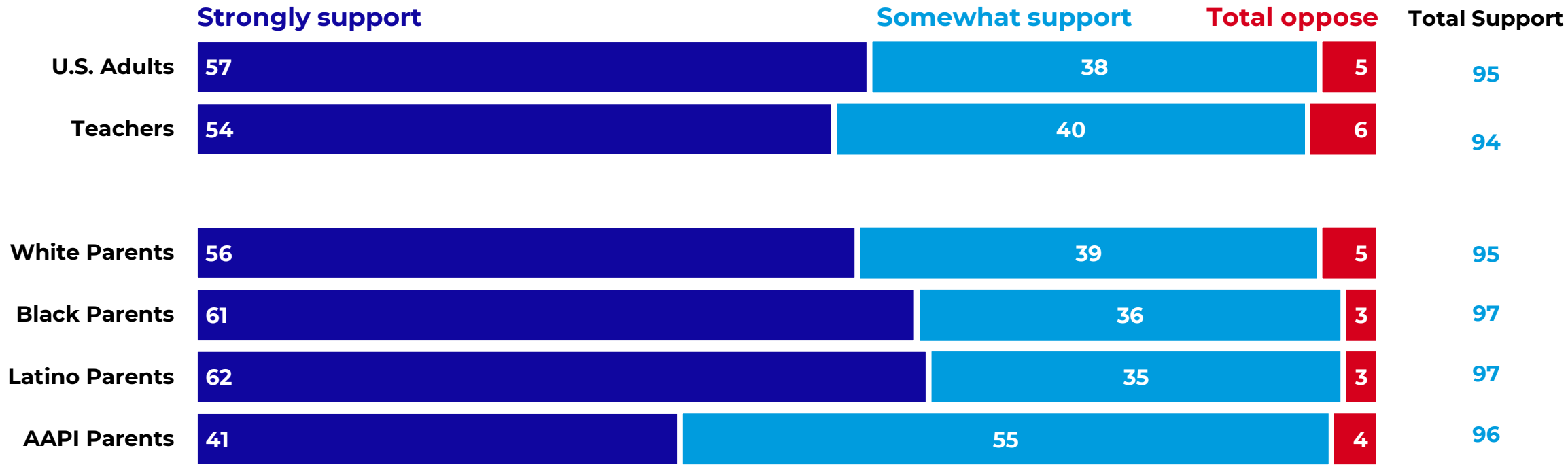
The early grades are seen as fundamental. Parents and teachers alike want to make sure that students get a solid grasp of the basics first; without that, skills like problem solving and logical reasoning cannot be fully developed. They prioritize visual, tactile learning that makes math feel more tangible, more engaging, and less abstract for younger students.

But while elementary school should lay the foundation, high school presents an opportunity for more differentiation. Parents and teachers recognize that each student not only learns differently, but has unique interests, goals, and aspirations. They say that offering students a range of math courses available to choose from will make them more interested in, and thus more successful in, math – and will better prepare them for success.

> *"Math is really all around us and people don't have to just do the basics... once they've learned all the basics and they're through middle school, I think high schools have the opportunity to offer different kinds of math classes."*
>
> *— CA Parent, Latino*

Adults, teachers, and parents support making sure that high school students have access to math courses that are relevant to what they may choose to do post-graduation

Do you support or oppose making sure that the math courses available to high school students are relevant to what they will do after graduation, either in college or in their career?



Key Findings from Across the Research

- ✓ Math is identified as the subject most important for students to take, but also as the one most in need of updating and improvement in terms of the way it is taught.
- ✓ The fundamental priority among parents, teachers, and the public at large when it comes to math education is making instruction more **engaging** and **real-world relevant** for today's learners.
  - ✓ **Engaging:** Many parents say that math learning feels to their child more like a tedious chore to slog through than like an interesting challenge to tackle. As a result, far too many students are not engaged in what they are learning and therefore are not reaching their full potential in math class.
  - ✓ **Real-world relevant:** The public believes that most math instructional content a) is disconnected from students' lives and larger worlds outside of the classroom, and b) has not kept up as society and technology have evolved – meaning that we are missing a critical opportunity to better prepare students for success, whether in their daily adult lives or as professionals.
  - ✓ The two points above are intrinsically linked, as parents and math teachers say that making math learning more relevant also will make it more engaging and interesting for students.
- ✓ The public and parents believe not only that math education must prepare students for basic life tasks that require the use of numbers, but that it should make them better problem solvers and critical thinkers.
- ✓ Making math education more relevant and engaging is perceived as important not just for its own sake, but because success in math class will increase students' chances of success in the future.

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Thank You

New York Washington, DC Hartford Chicago Denver Seattle