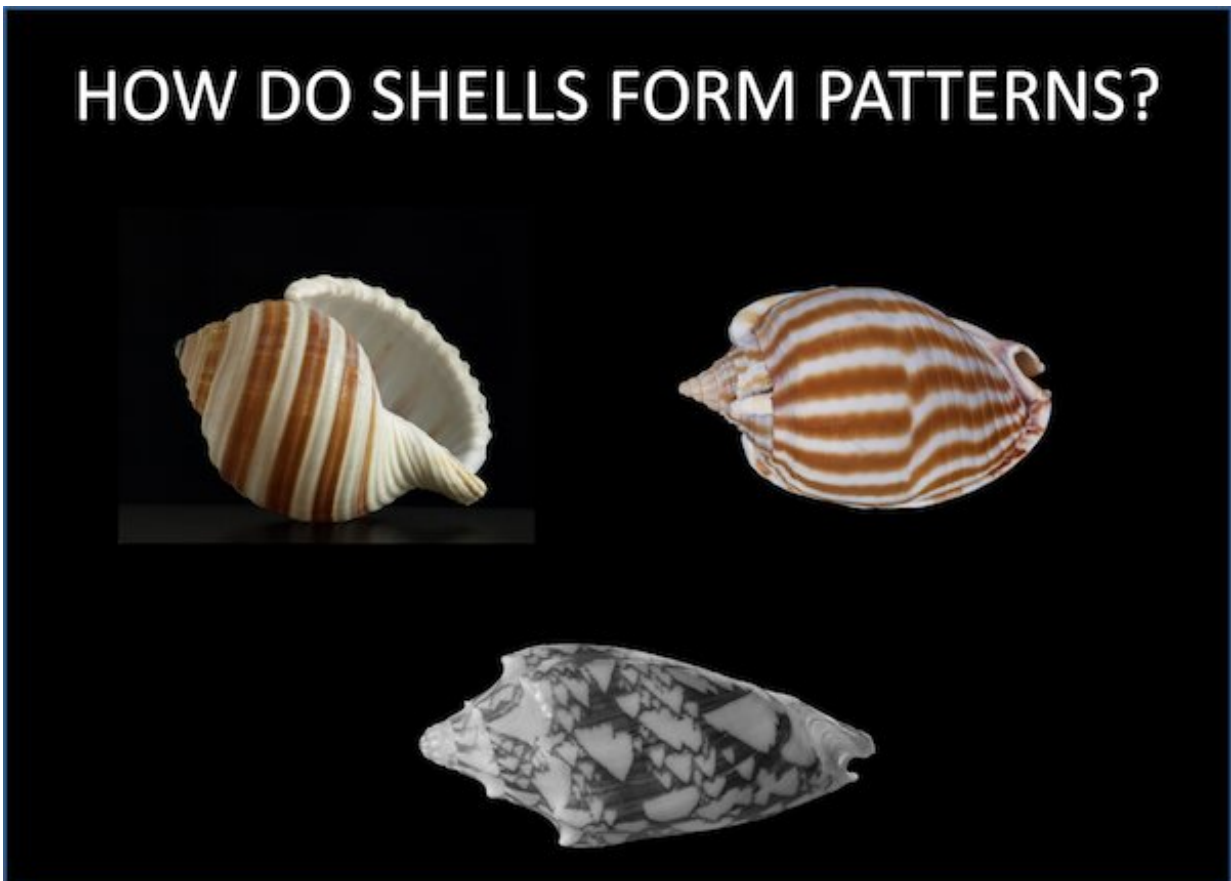


Declines in math readiness underscore the urgency of math awareness

April 3 2023, by Manil Suri



Math exercise for shells can be downloaded at https://www.manilsuri.com/assets/shell_patterns.pptx. Manil Suri, Author provided

When President Ronald Reagan [proclaimed the first National Math Awareness Week](#) in April 1986, one of the problems he cited was that too few students were devoted to the study of math.

"Despite the increasing importance of mathematics to the progress of our economy and society, enrollment in mathematics programs has been declining at all levels of the American educational system," Reagan wrote in his proclamation.

Nearly 40 years later, the problem that Reagan lamented during the first National Math Awareness Week—which has since evolved to become "[Mathematics and Statistics Awareness Month](#)"—not only remains but has gotten worse.

Whereas 1.63%, or about [16,000](#), of the [nearly 1 million](#) bachelor's degrees awarded in the U.S. in the 1985–1986 school year went to [math](#) majors, in 2020, just 1.4%, or about [27,000](#), of the [1.9 million](#) bachelor's degrees were awarded in the field of math—a small but significant decrease in the proportion.

Post-pandemic data suggests the number of students majoring in math in the U.S. is likely to decrease in the future.

A key factor is the [dramatic decline in math learning](#) that took place during the lockdown. For instance, whereas 34% of eighth graders were proficient in math in 2019, test data shows the percentage [dropped to 26% after the pandemic](#).

These declines will undoubtedly affect how much math U.S. students can do at the college level. For instance, in 2022, only [31% of graduating high school seniors were ready for college-level math](#)—down from 39% in 2019.

These declines will also affect how many U.S. students are able to take advantage of the growing number of [high-paying math occupations](#), such as [data scientists](#) and [actuaries](#). Employment in math occupations is projected to [increase by 29%](#) in the period from 2021 to 2031.

About [30,600 math jobs](#) are expected to open up per year from growth and replacement needs. That exceeds the 27,000 or so math graduates being produced each year—and [not all math degree holders](#) go into math fields. Shortages will also arise in several other areas, since math is a gateway to many STEM fields.

For all of these reasons and more, as a [mathematician](#) who thinks deeply about the [importance of math](#) and what it means to our world—and even to [our existence as human beings](#)—I believe this year, and probably for the foreseeable future, educators, policymakers and employers need to take Mathematics and Statistics Awareness Month more seriously than ever before.

Struggles with mastery

Subpar math achievement has been endemic in the U.S. for a long time.

Data from the National Assessment of Educational Progress shows that [no more than 26% of 12th graders](#) have been rated proficient in math since 2005.

The pandemic [disproportionately affected](#) racially and economically disadvantaged groups. During the lockdown, these groups had [less access to the internet and quiet studying spaces](#) than their peers. So securing Wi-Fi and places to study are key parts of the battle to improve math learning.

Some people believe math teaching techniques need to be revamped, as

they were through the [Common Core](#), a new set of educational standards that stressed alternative ways to solve math problems. Others want a return to more traditional methods. Advocates also argue there is a need for colleges to [produce better-prepared teachers](#).

Other observers believe the problem lies with the "[fixed mindset](#)" many students have—where failure leads to the conviction that they can't do math—and say the solution is to foster a "[growth](#)" [mindset](#)—by which failure spurs students to try harder.

Although all these factors are relevant, none address what in my opinion is a root cause of math underachievement: our nation's ambivalent relationship with mathematics.

Low visibility

Many observers worry about how U.S. children fare in [international rankings](#), even though math anxiety makes [many adults in the U.S.](#) steer clear of the subject themselves.

Mathematics is not like art or music, which people regularly enjoy all over the country by visiting museums or attending concerts. It's true that there is a National Museum of Mathematics in New York, and some science centers in the U.S. devote exhibit space to mathematics, but these can be geographically inaccessible for many.

A 2020 study on media portrayals of math [found an overall "invisibility of mathematics"](#) in popular culture. Other findings were that math is presented as being irrelevant to the [real world](#) and of little interest to most people, while mathematicians are stereotyped to be singular geniuses or socially inept nerds, and white and male.

Math is tough and typically takes much discipline and perseverance to

succeed in. It also calls for a [cumulative learning approach](#)—you need to master lessons at each level because you're going to need them later.

While research in neuroscience shows almost everyone's brain is [equipped to take up the challenge](#), many students balk at putting in the effort when they don't score well on tests. The [myth that math is just about procedures and memorization](#) can make it easier for students to give up. So can [negative opinions](#) about math ability conveyed by peers and parents, such as declarations of not being "[a math person](#)."

A positive experience

Here's the good news. A 2017 Pew poll found that despite the bad rap the subject gets, [58% of U.S. adults enjoyed their school math classes](#). It's members of this legion who would make excellent recruits to help promote April's math awareness. The initial charge is simple: Think of something you liked about math—a topic, a [puzzle](#), a fun fact—and go over it with someone. It could be a child, a student, or just one of the many adults who have left school with a negative view of math.

Can something that sounds so simplistic make a difference? Based on my years of experience as a mathematician, I believe it can—if nothing else, for the person you talk to. The goal is to stimulate curiosity and convey that mathematics is much more about exhilarating ideas that inform our universe than it is about the school homework-type calculations so many dread.

Raising math awareness is a first step toward making sure people possess the basic math skills required not only for employment, but also to understand math-related issues—such as gerrymandering or climate change—well enough to be an informed and participating citizen. However, it's not something that can be done in one month.

Given the decline in both math scores and the percentage of students studying math, it may take many years before America realizes the stronger relationship with math that President Reagan's proclamation called for during the first National Math Awareness Week in 1986.

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