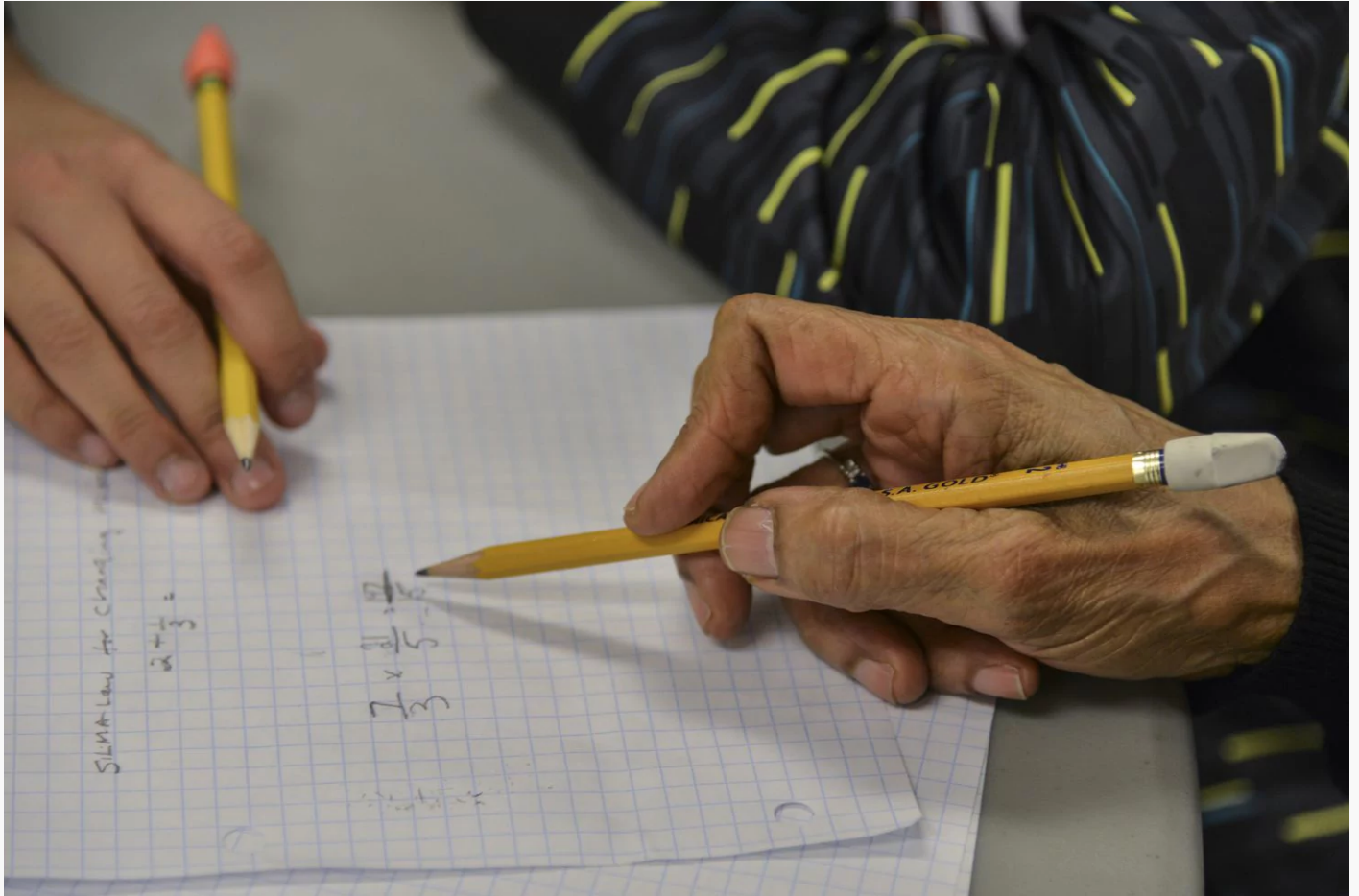


# A math problem for Pi Day

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An educator in the District demonstrates a simple mathematics diagnostic test in Washington. (Jahi Chikwendiu/The Washington Post)

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As a mathematician, I have dreams about Pi Day : Strangers would offer me flowers, give up their seats on the subway and even let me cut in line during rush hour. After all, the power of mathematics is extraordinary, allowing us to land a rover on Mars, build a computer to outthink chess masters and use a phone to navigate anywhere in the world.

My dreams are not too far from today's reality. When strangers discover my profession, it is often followed by the phrase, "You must be smart." This is startling considering they know nothing of my talents or achievements (or lack thereof), bestowing admiration based solely on math. While a part of me rejoices in hearing their words, would I have received a similar reaction had I been a historian, a writer, an artist?

Not likely.

The reason is an unspoken spectrum of smart in society today, a quick way to size up someone based on their choice of career or college major: art < literature < history < economics < biology < math.

As one moves to the right on this spectrum, ideas become purer, cleaner and more measurable. The narrative casts mathematics and the sciences as stewards of difficult ideas, with the humanities and arts relegated to the simpler struggles. We assume that exploring black holes, protein folding and artificial intelligence is more baffling and opaque than analyzing history, writing poetry or shaping sculpture.

This assumption is not only flawed but also completely backward, for there is a missing part to this story: the hidden dimension of complexity.

Although measurability increases toward the right of the spectrum, complexity increases toward the left. By their very nature, questions in science and math become less messy, yielding more accurate solutions, whereas ideas in the humanities are more complicated, resulting in less precision.

To see why, let's talk about seafood: A mathematician is given a fish, gutted and scaled. Asked to count the number of its bones, she does so admirably, proclaiming there are 84. The audience is wowed. Such precision! She is asked to

do this again, to confirm her calculations. She again gets 84 bones. Such accuracy! Such consistency!

The biologist is asked the same question, but now the fish is moving and full of life. Because of the increase in difficulty, the biological calculation will not be as accurate or consistent as the mathematical one. The historian is requested to discover where the fish was swimming a month ago. And the artist is tasked with capturing what the fish might have imagined and perceived in its ecosystem. Complexity is inversely related to measurability.

Scientific marvels surround us: splitting atoms, peering into black holes and manipulating genomes. Yet the 21st century continues to grapple with the basic themes and issues encountered in the humanities over the centuries: gender and race, beauty and acceptance, truth and power. Stories of Black Lives Matter, #TimesUp and fake news still take the front page. This should not surprise us. These problems are not rocket science; they are far more difficult than rocket science. Putting a man on the moon is the easy stuff.

Written texts offer clues as well. Profound notions in mathematics and quantum mechanics — dealing with algebraic varieties and space-time curvatures in relativity — are captured by elegant equations and tight notations, wonderfully packaged in a handful of pages. Compare this to, say, sociological scholarship. The eminent philosopher Charles Taylor, in his groundbreaking work “A Secular Age,” invests nearly 100 pages of his 800-page tome just to define and tease out the word secular. The situation becomes more precarious as we move toward the arts, which cannot be summarized by codes and symbolism.

There may be very young chess and math prodigies, but there are no literary critics in elementary school. Nor are there artworks of 9-year-olds on the walls of the Museum of Modern Art. Unlike the cleanliness of mathematics and computer science, with its set of axioms and algorithms, a young mind cannot master the

intricate natures of philosophy and literature and art. We fail to recognize that science is about the simple “could,” not the complex “should.”

Our nation’s STEM (science, technology, engineering and mathematics) programs are doing a wonderful job helping us think about the world substantively (facts matter), clearly (respect logical coherence) and critically (interrogate individual biases). The arts and humanities also embrace these outcomes, but they offer a different set of values needed for probing complex frameworks: appreciating close readings of texts, unpacking the subtlety of rhetoric, embracing multiple ways of knowing and valuing experiences acquired through arduous history. The world would be a better place if we can open our young minds to the rigors of disciplines beyond STEM.

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