Lowell Milken Center for Unsung Heroes
ARTEFFECT

Impact Statement

Zebiniso Davletova, Grade 10
Bridge Between the Past and Now, 2026
Mixed media on paper, 23.5 x 33.5 inches
98-school, Tashkent City, UZBEKISTAN
Unsung Hero: Muhammad Musa al-Khwarizmi

As an Uzbek girl also born in the territory of ancient Khwarazm (nowadays Khwarazm region of Uzbekistan), Al-Khwarizmi is one of those historical figures who has always stirred a deep sense of patriotism in my heart. Even though I cannot call myself a math genius, studying his legacy fills me with pride simply because I am a distant descendant of his generation. It often saddens me that many teenagers in my country today view mathematics as useless or boring, all while obsessing over the very modern gadgets that exist solely because of it. They enjoy the fruits of modern technology without realizing that our direct ancestor laid the foundational logic for these algorithms over a millennium ago. Regarded as one of history's most impactful mathematicians— the "Father of Algebra," one of humanity's core sciences—Al-Khwarizmi also made significant contributions to geography, astronomy, and history; in other words, he seamlessly connected his knowledge across various disciplines.

Born in the 780s in Khwarazm, Al-Khwarizmi later advanced his groundbreaking work at the House of Wisdom (*Bayt al-Hikmah*) in Baghdad, ultimately bridging ancient wisdom with the future of global innovation. While serving as the director of the Abbasid Caliphate's central library in the 820s, he authored his famous book, *Al-Kitab al-mukhtasar fi hisab al-jabr wa'l-muqabala* (*The Compendious Book on Calculation by Completion and Balancing*), where the roots of algebra began. In the 820s, he introduced Indian numerals through another of his works, *Kitab al-Jam' wa-l-tafriq bi-hisab al-Hind* (*The Book of Addition and Subtraction According to the Hindu Calculation*); this laid the foundation for the decimal system and gave rise to the term "algorithm." During this period, he also compiled the astronomical tables of *Zij al-Sindhind,* mapping the movements of the Sun, the Moon, and the five planets known at the time. In the 830s, he turned his attention to a different field: geography. His *Kitab Surat al-Ard* (*The Book of the Description of the Earth*) detailed the coordinates of rivers, seas, and mountains, building upon and refining the work of Ptolemy. Throughout the 830s and 840s, he participated in research expeditions to Byzantium and Khazaria, studying ancient manuscripts and refining geographical measurements. In his final years, from 840 to 850, he dedicated himself to astronomy in Baghdad, authoring treatises on the construction and use of astrolabes and sundials.

In the 21st century, Al-Khwarizmi's contributions command immense global respect. It was through his work that algebra emerged as a distinct discipline. The numbers that

play such a vital role in our daily lives—from prices and timekeeping to spatial data—gained global recognition thanks to him. The concept of the "algorithm"—a term derived from his name—lies at the very heart of all modern digital technology and artificial intelligence; without it, our world today would look vastly different. Furthermore, his introduction of Indian numerals and the concept of zero marked a monumental turning point in global arithmetic, while his manuscripts on astronomy and geography served as essential guides for future generations. Today, those familiar with his legacy often jokingly remark that Al-Khwarizmi is constantly watching us from inside our own gadgets.

As for the portrait I drew, I depicted Al-Khwarizmi with a wise, calm, and gentle smile. When I searched for images of him online, I found a wide variety of portrayals; nevertheless, I synthesized the facial expressions across them to create my own representation. Because the color blue always reminds me of technology and mathematics, I chose it for his attire and as the primary color accent. The measurements and inscriptions drawn on the yellow parchment were taken directly from his book. The depiction of architecture against a parchment background signifies history and the scholar's place of origin, while the surrounding geometric measurements symbolize his significant contributions to the architecture of that era. The camels represent not only the primary mode of transport at the time but also the spirit of the epoch itself. In the center of the artwork, the Indian numerals he introduced to the world merge into modern digital computer systems, illustrating one of his pivotal achievements. An astronomical element in the bottom right corner depicts his study of the celestial movements of the Sun, Earth, and Moon, incorporating excerpts from his texts. In the top left corner, I visualized 3D shapes based on the geometric formulas he calculated. Adding a yellow and white glow is one of my signature artistic styles, as I feel it gives a magical quality to the artwork. That said, I cannot deny that a touch of controlled chaos often finds its way into my drawings.

Working on this piece completely shifted my perception of mathematics, helping me realize that math is not just a set of simple numbers, but a distinct form of art. Being originally from Khwarazm, creating this drawing inspired me deeply and helped me cherish my homeland even more—knowing that such monumental figures once walked the very soil where I spent my childhood. Working with mixed media—combining gouache, watercolor, oil pastels, acrylic paint, acrylic markers, alcohol markers, and colored pencils—was a formidable challenge, but it proved to be a wonderful opportunity for creative growth. Through art, I realized I could build a bridge between the past and the present, inspiring my peers to extend that bridge into the future.

References:

https://en.wikipedia.org/wiki/Al-Khwarizmi