



## Impact Statement

Jane Lee, Grade 9

***Sofya Kovalevskaya: A Visionary***, 2026

Acrylic on canvas board, 16 x 24 inches

Bellevue High School, Bellevue, WA

Unsung Hero: Dr. Sofya Kovalevskaya

Sofya Kovalevskaya refused to live within the boundaries set for her and instead expanded them, showing that determination and intellect can challenge even the most rigid social barriers. Her life stands as a powerful example of what can happen when someone insists on learning, thinking, and contributing despite being told they should not.

She was born in 1850 in Russia at a time when women were not allowed to attend universities. From a young age, she showed a deep curiosity about mathematics, even learning from notes on calculus that were used as wallpaper in her childhood home. Because she could not formally enroll in school, she entered a marriage of convenience so she could leave Russia and study abroad. In Germany, she worked with Karl Weierstrass, who immediately recognized her brilliance. Since she was not allowed to attend lectures, he taught her privately, guiding her through advanced mathematical concepts. Her dedication paid off when she earned a doctoral degree, becoming one of the first women in Europe to achieve such a distinction in mathematics.

The painting captures both her intellectual achievements and the broader meaning of her life. The chalkboard filled with equations represents her contributions to differential equations and mathematical theory. The presence of scientific formulas, including  $E=mc^2$ , symbolizes the larger scientific world she helped shape, even if that equation came after her time. The classroom scene shows her teaching, reflecting her role as a professor at Stockholm University, where she became one of the first female professors in Europe. This part of the painting emphasizes her influence on students and the importance of education in carrying ideas forward.

Other sections of the painting add depth to her story. The library suggests knowledge, study, and persistence, highlighting how much effort it took for her to access information that was freely available to men. The domestic interior scene reflects the expectations placed on women during her time, showing the contrast between traditional roles and her pursuit of a professional life. The image of a heart on a page connects to her emotional and creative side, as she also wrote literature and explored personal themes in her work. The courthouse-like structure and the "justice" sign symbolize the broader fight for equality, connecting her personal journey to the larger movement for women's rights.

Her impact reaches far beyond her mathematical discoveries. She proved that women belong in academic and scientific spaces, even when institutions try to exclude them. By becoming a

respected scholar and professor, she challenged long-standing beliefs about who could contribute to intellectual life. Her achievements opened doors for other women, helping to create opportunities that did not exist before. Today, her legacy lives on not only in mathematics but also in the continued efforts toward equality in education and professional fields. She showed that progress often begins with one person willing to question the limits placed on them and to keep going regardless of the obstacles.

In addition to her academic work, she lived a life marked by persistence in the face of personal and professional challenges. She balanced her intellectual ambitions with the realities of being a woman in the nineteenth century, navigating expectations that often conflicted with her goals. Her willingness to continue despite rejection and isolation demonstrates a kind of resilience that goes beyond talent alone. She was not simply a mathematician who succeeded, but someone who had to create the conditions for her own success in a world that was not designed to support her.

Her work in mathematics, especially in areas like partial differential equations and mechanics, contributed to the foundation of modern scientific thinking. These contributions continue to influence how complex systems are understood today, even if her name is not always widely recognized outside academic circles. More importantly, her presence in these spaces helped normalize the idea that women could think abstractly, teach at the highest levels, and contribute original ideas to science. For women, her life represents both a breakthrough and a reminder of the work that remains. She challenged stereotypes that limited women's education and showed that intellectual achievement is not restricted by gender. For society, her story reinforces the importance of access to education and the value of diverse perspectives in advancing knowledge. The painting, with its blend of scientific imagery and symbolic scenes, reflects not only what she accomplished but also what she made possible for others.