



THE ALGEBRA PROJECT, INC.

"Math literacy is the key to 21st century citizenship."

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"Math Literacy for All": Lessons Learned by the Algebra Project 1982-2024

"Math literacy is the key to 21st century citizenship." This statement on the Algebra Project's letterhead frames math literacy as essential for *all* students. Robert P. Moses founded the Algebra Project in 1982 to address the inequities in access to algebra in middle school, and higher-level math courses in high school, by improving the middle school path to Algebra 1 taken in Grade 8. His goal was to engage students who did not enjoy math or see it as relevant to their future, and to provide them, as well as higher performing students, with deep understanding of foundational mathematics concepts.

Moses used community organizing skills that he learned in the Mississippi theatre of the Civil Rights movement, ideas about mathematics as a language that he learned at Harvard's Dept. of Philosophy, and ideas about experiential learning, to engage students, teachers, school and district leaders, community members, university faculty and education professionals in math education reform from both "bottom up" and "top down."

Between 1991 and 2023, the Algebra Project worked in over 200 middle schools and 20 high schools, to try out new materials and teacher professional development. Teachers attended summer institutes and were coached in using "curricular interventions" that captured new pedagogy. They also learned social facilitation skills found in research on effective leaders: accurate empathy, cultural sensitivity, and cognitive flexibility. Later the project and university colleagues developed some high school experiential learning modules and a cohort model to "harness the peer culture." Currently the project is developing modules to make calculus accessible at the level of Algebra 2.

Educators now embrace culturally responsive teaching and assessment, the importance of "big ideas" in mathematics, and of student voice and agency -- issues also embedded in Algebra Project pedagogy and teacher professional development. Yet the achievement levels of Black and Brown students remain low. What has the Algebra Project learned that led to successful outcomes for students and teachers in many sites?

Lessons Learned

- Teacher engagement, voice, empowerment, and confidence to guide their students' learning is essential.
- Teachers are empowered when they are learning math themselves and are enabled to design and fine tune learning activities (within existing standards).
- Success for all students in Gr 8 Algebra I should be situated in a K-12 trajectory for mathematics as a literacy for all students.
- Given solid preparation in foundational mathematics in middle school or early high school, low performing students can succeed in the more rigorous courses and do not need to be placed into lower tracks.
- Full support of school administrators and key district administrators for at least three years is essential to sustaining and fine-tuning a successful project.

- In high school, student success was greater with extended math periods and support for re-taking state-mandated tests rather than repeating courses.
- Student success was greater in middle and high schools where students participated in the near-peer model of the Young People's Project, which places success in the hands of young people.
- A strong parent/community group and support from local IHE faculty are important to sustain the project through initial implementation and fine tuning.
- Progress can be made only when the people "experiencing the problem" are included as co-designers of math literacy solutions.

Outcomes

Middle schools: In three middle schools (Cambridge, MA; Jackson, MS; and San Francisco) where more than half of the students had Algebra Project teachers, graduates entered Geometry in Gr 9 and more advanced math courses in Gr 10-11 at about twice the rate of students in other middle schools in the same district.

At the Dr. Martin Luther King Jr Academic Middle School in San Francisco, in 1991, the Principal and teachers organized to enable **all** students to take Algebra I in Gr 8 using a district-approved textbook (CPM). All general education students as well as a majority of those whose IEPs allowed them, took Alg I in Gr 8. The teachers revamped the Gr 6-7 curriculum so that students began the Alg I textbook in Gr 7. King middle school grads of 1996 and 2000 were followed into SF high schools; the % of King grads taking courses **above** Alg I (Geom/IMP3-4) was about twice that of grads of similar middle schools. Similarly, in Gr 10, a higher % of King grads were enrolled in courses **above** Geometry. At the same time, a smaller % of King grads were taking lower-level math courses in high school.

High schools: Moses developed a model to accelerate students in high school after working at Lanier High School in Jackson, MS, for a decade. He kept students together in a cohort and attracted university mathematicians to develop experiential modules for foundational concepts. Research in 11 high schools from 2008-2018 (including cohorts of students performing in the lowest quartile on Gr 8 state tests) found that students passed state-mandated tests, passed math courses, and graduated on time at higher rates than nonAlgebra Project students in the same school or demographically matched comparison groups.

Scan this QR code for more on Algebra Project Purposes, Pedagogy and Outcomes
or see <https://algebra.org/wp/resources/>

