A Message from Interim Executive Director Ben Moynihan

Dear Friends of the Algebra Project,

On one sunny afternoon in the fall of 1991, sitting in his family’s living room, Bob Moses asked me if I’d like to join the Algebra Project to work on an African Drums & Ratios Curriculum. I said yes, inspired first by what I knew about the role he and SNCC peers played in the early 1960s struggle that Black Mississippians waged to exercise their right to vote, and second, by his vision for Algebra and college preparatory mathematics as a key to opening doors of opportunity.

Bob didn’t accept my enthusiasm that day. Rather, he encouraged me to think it over carefully and get back to him. He knew what it would take to help as he organized an army of mathematicians, teachers, and community folks in service of opening up high level mathematics to every student. I think he wanted to make sure I was prepared to stay the course.

I am still here and as we approach 2023, 41 years after Bob started the Algebra Project, the math insurgency he started is also still here. And we believe all the more strongly that every child can learn the math they need to graduate high school, and be ready for the college or career they choose and therefore to exercise their full citizenship in today’s 21st century democracy and Information Age economy.

The dismal math scores from the 2022 National Assessment of Educational Progress (NAEP) along with the COVID-19 pandemic together laid bare the pre-existing and underlying inequities too many students are exposed to and suffer through because of our ill-conceived national education policy. Bob spoke of such inequities as “…a constitutional fault line — an embedded caste system — that we need to find our way across. It is a fault line that is not only about race: class, identity and disabilities also block the path to equal educational opportunity for millions of students.”

Bob’s struggle continues: as a nation we have yet to see all students in the nation as our students, and as such, we have yet to agree that all young people are to be guaranteed a high-quality public school education — it is neither enshrined in our Federal Constitution nor operationalized in how we run the nation’s public schools. (cont'd on page 5)
The Surprising Depth of Elementary Mathematics
by Aidan Soguero

Research often serves as a mode of storytelling. Researchers aim to uncover answers to questions that can help describe our world, and in doing so, by necessity, tell the story of that question and answer. But our individual stories are unique and full of bias, spilling the secrets of what we value, and the stories we tell can have an impact on what our students learn to value.

For Robin Wilson, a Professor of Mathematics at Loyola Marymount University, the stories researchers decide to tell have an outsized effect on what the K-12 classroom looks like, and when researchers aren’t cognizant of that fact, it’s tantamount to recklessness. To him, alongside the content of classes, how undergraduate classes are taught is learned by students, and when those students themselves become teachers they will pass on the culture that was ingrained in them.

“The college math classroom sort of sets the stage in a sense for every K-12 pathway.” Explains Robin, discussing the ways he’s noticed how a dominant culture can take hold in academia, and why he is hopeful change is coming.

Robin’s own experience in academia is one he feels lucky to have had. Cal Poly Pomona and UC Davis, two institutions where he’s been a faculty member, both encouraged his interest in K-12 education. But oftentimes, others entering into research institutions aren’t so lucky.

“Entering tenure track positions, you hear a lot of chatter about needing to be careful about taking on things outside of the research agenda because so much of the success in the math research community at the university level is centered around, you know, the research productivity.” He tells me.

But for Robin, and a select group of renegade researchers like him, K-12 math is well worth exploring.

Ed Dubinsky was a groundbreaking research mathematician and math educator who collaborated with a small team of mathematicians at the Algebra Project in the first decade of the 2000s to develop our high school materials. He was an inspiration for Robin. They went on to write a research paper together. Robin learned from people like him, alongside other mathematicians who’ve collaborated with the Algebra Project like Greg Budzban and the late David Henderson. They modeled the idea that one can be a well-respected research mathematician and also make impactful contributions to K-12 education. Having a space for this unique community of researchers Robin attributes to the work of Algebra Project founder, Bob Moses.

The bifurcated path research mathematicians are taking is new. The one Robin took in which one remains involved in the K-12 systems they were brought up in, the path in which Robin carved out community for himself, wasn’t always an option. And the other, the one in which those K-12 systems are largely ignored to focus instead on research productivity, is the more traditional path. That is still the dominant route researchers are taking.

Robin’s journey shows that taking the road less traveled is possible, but the obstacles he encountered along the way are emblematic of systemic issues that pervade throughout the US educational machination.

Robin’s mother was a public school teacher in Sacramento. While she wasn’t a mathematician, she wanted Robin to have
the resources and preparation necessary to pursue STEM if he chose, despite the hurdles she knew he would encounter being Black in what is still a predominantly white field.

“I was trying to understand in my high school, which was really diverse and had a large Black and Latino population, why was I the only Black student in these classes? And I don’t remember any other Hispanic or Latino students in these classes with me.” Robin would go on to recall a time his high school counselor condescendingly suggested he retook pre-algebra. Robin had already passed pre-algebra in eighth grade.

He persisted regardless. From his participation in the Math, Engineering, and Science Achievement (MESA) after-school program, to the start of his undergrad years at UC Berkeley, where he partook in professional development under MacArthur Fellowship recipient Uri Treisman, Wilson credits his STEM identity to his mother.

He began his journey as a math researcher when he was recruited as an undergrad to be a teaching assistant in that same Berkeley program.

“That opportunity to teach math to others and help folks that were struggling to understand the subject, I just loved it. And that's how I decided to pursue math as a degree, and math teaching as a career path. And it was actually while I was in the program that there was a visit from the Algebra Project.”

Years later, now at UC Davis, Robin would have another experience with the Algebra Project, this one setting up a new trajectory in his life. Bob Moses was doing professional development for teachers and, upon his mom’s invitation, Robin decided to sit in.

“He did the Height Chart activity and I remember him, you know, posing the question about evidence for why -1 times -1 equals 1. And I found that just to be really profound and deep. I'd never thought about the depth of elementary school mathematics before.” This would become a theme in Robin’s life as he engaged with more research mathematicians working in K-12 spaces.

“There was David Henderson, who just passed away in December 2018. I asked him, ‘so what kind of math are you thinking about these days, David?’ and this Cornell professor who has this really amazing college-level geometry book that he rewrote for Algebra Project high school students replies, ‘I’m still thinking about two times three and whether it’s two acting on three or three acting on two, there's just so much there.’ And I was just like, ‘okay, I gotta go think about that one.’”

It occurred to Robin that very few people at the research level of mathematics were considering the depth of K-12 math. And that this notion of K-12 mathematics being irrelevant at the research level was harming graduate classrooms, but thanks to the community he’s found from his friendship with Bob, he has hope.

“You know, I remember Ed Dubinsky saying to me he spent his whole career trying to figure out how to make sense of his two interests: mathematics and social justice. And he had finally found it in the Algebra Project. I saw people that were much older than me that had been grappling with the same kinds of issues that I've been grappling with, you know, for decades. That also found this really strong sense of community, and like-minded people and a safe space to think about these issues, to talk about them within the Algebra Project.”

Robin believes research mathematicians have a big role to play in K-12 mathematics, whether they like it or not.

“Mathematicians, from the graduate classroom, have a chance to change the narrative about what and how students should be learning in this K-12 system as well as what things around mathematics our society should really value. And those who choose not to engage with those issues are reinforcing the status quo. I don't think many have the same sort of equity-focused lens that the Algebra Project and its community does. And I've seen that increase over the years and I can't prove this, but I have a strong hunch that Moses’ book Radical Equations and the Algebra Project movement has made a big impact on the push for equity in math education in general and undergraduate math education in particular. Like, the idea of math as a civil right has almost become a household idea.”
**The Bob Moses Speaker Series** Conference II will be held in person and online Saturday and Sunday, January 28th and 29th, 2023 at the MIT Media Lab. The Conference Theme: The Vote, Caste, and the Carceral State. We are honored to join Dr. Janet Jemmott Moses, The Bob Moses Fund, Cambridge Community Foundation, NAACP Cambridge Branch, YPP, MIT, A Special Gathering, and more collaborating in this convening. Register online today: [https://www.bobmosesconference.com/](https://www.bobmosesconference.com/)

**Educational Testing Services (ETS)** announced a new scholarship named after Bob Moses. It will provide $15,000 to a graduate in the STEM field. Email Jamal Watson Executive Director, Center for Advocacy and Philanthropy, JWATSON002@ets.org, for more information.

The Algebra Project salutes the life of **Staughton Lynd**, 11/22/1929 to 11/17/2022. Lynd was instrumental in organizing freedom schools for the 1964 Mississippi Summer Project alongside Bob Moses, Charlie Cobb, and many others. He was an antiwar activist, author, and lawyer who cared deeply about civil rights. Read more on Democracy Now!: [https://bit.ly/3Vnm1tc](https://bit.ly/3Vnm1tc)


An **Algebra Project Inc, Southern Initiative Algebra Project**, and **Young People's Project** planning meeting took place in Princeton, New Jersey November 3rd through 6th to discuss future collaborative initiatives. It was facilitated by Jim Burruss and Mary Fontaine with Andrew Wynn, Jesse Cooper-Davis, Nancy L. Dennis, and Dave Dennis from SIAP; Maisha Moses, Marquis “Keke” Lowe, Charlene DeLeon, April Davis Dortch, and Cliff Freeman from YPP; and Khari Milner, B.J. Walker, Bill Crombie, Edwige Kenmegne, and Ben Moynihan from AP Inc.

![Photo of meeting participants](image)

_LtoR: Jim Burruss, Ben Moynihan, Andrew Wynn, Bill Crombie, Mary Fontaine, Maisha Moses, Marquis “Keke” Lowe, April Davis Dortch, Charlene DeLeon, B.J. Walker, Cliff Freeman, Edwige Kenmegne, Jesse Cooper-Gibbs, Khari Milner, Dave Dennis, Nancy Ledford Dennis_
Like the Mississippi sharecroppers, day laborers, organizers, and volunteers who fought so valiantly for the vote, we invite you into this struggle for mathematics and high-quality education for all. That is the work Bob asked us to continue – using Algebra to open up space in our schools for students and teachers to take the lead on preparing future generations with the mathematical fluency required for full participation in American democracy. At the Algebra Project, our enduring purpose is to provide the curriculum, pedagogy, professional development, and organizing strategies schools can use to open up spaces in which students and teachers can work together, co-creating understanding and proficiency in mathematics.

I did not yet appreciate that the kind of change that Bob envisioned would require generations to realize. Nor could I foresee that an initial three-year commitment would lead me on a circuitous path through thirty years, and counting, with the project.

In the fall of 1991, one afternoon in the Moses family’s living room, I joined a learning community that frames math education as a social justice issue, fighting alongside our young people and teachers as they step into their own intrinsic power as learners, as teachers, as people. As we rededicate ourselves to carrying forward Bob’s vision for raising the floor of K-12 math literacy, we humbly ask for you to join us, as an ally, collaborator, and donor. Please visit our website at https://www.algebra.org/ to learn how you can get involved and support this work. Thank you!

The Algebra Project, Inc.
Cambridge, Massachusetts
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A word not often associated with mathematics is “obvious”. We usually ignore the obvious. That which is obvious is most often in the background, but mathematics tends to raise the obvious, almost in relief, and pulls it to the front of the stage. Mathematics looks at how those obvious things are hooked together, and casts these relations in symbolic representations. So, when we talk about abstraction in the mathematical sense, why do so many think of it as difficult? In part this is because in mathematics we're often asked to attend to things, which in normal everyday life we don’t attend to, because they’re obvious.

The Algebra Project’s Five-Step Curricular Process is a pedagogical approach that aims to bring students from an intuitive understanding of the world around them to a deeper understanding of the abstract concepts and procedures of the mathematics they are learning in school. After students have moved through the first step of the process – a shared concrete experience – they are asked, in the second step, to make a picture or model of that experience. This step provides affordances to student learning at a number of different levels. The process of drawing pictures or making models gives students the chance to bring their imagination and creativity to the task as an artistic endeavor itself. For example, when the shared event is a trip, either on the subway, a bus or even a walking tour, students often paint a mural capturing the things they find most interesting about the trip. This step in the curricular process, for most if not all students, does not feel like they are doing mathematics. At this stage students are not yet dealing with anything that they recognize as mathematics but are simply representing their experience in a way that seems
intuitive to them. “It’s art!” But this step in the process is actually the first step in a process of abstraction that will lead to what students clearly recognize as “real”, or more familiar, mathematics.

When students construct a picture or a model of the event, that model is a representation of the experience. It emphasizes those aspects that the students viewed as important or necessary and ignores other aspects of the experience. That process of attending to certain features of the event and ignoring others is the first act of abstraction in mathematizing the common shared experience. Even if only intuitively, some, and at times, all of the critical features of the shared experience are being communicated through the pictures and models which students create.

If his reading of the philosopher and logician Willard Van Orman Quine’s regimentation and structuring of ordinary discourse is most prevalent in the last two steps of the Five-Step Curricular Process, which we call (4) “Feature Talk” and (5) “Symbolic Representation”, then the first three steps, (1) A Shared Concrete Experience, and (2) A Picture/Model, and (3) “People Talk”, can be traced back to Algebra Project founder and Civil Rights Movement veteran Bob Moses’ apprenticeship in community organizing with Mrs. Ella J. Baker. A hidden figure of sorts to many outside of the 1960s civil rights movement, Ella Baker was deeply involved in the community organizing wing of the Civil Rights Movement. Bob was mentored by Ella in community organizing and practiced that tradition in, he referred to as, “the Mississippi Theater” of the Civil Rights Movement.

Bob came to understand that a primary tool of community organizing was the meeting, where the people most affected by an issue would come together in order to find and exercise their own voice on whatever issue local people may be grappling with. In this sense, Bob also saw the classroom as a meeting place, and consequently, it was seen as a place for teachers and students to organize themselves as a community around their common interests. In order to build a common interest around mathematics and to make it their own both teachers and students share a common experience that they will jointly mathematize and begin a process of abstraction that starts with a pictorial representation or model of the event.

For the past few paragraphs we’ve been talking about the cognitive side of the process. The other side is the socio-emotional side. Mathematics is a human activity, and the classroom is a place – a meeting tool – where teachers and students develop common interests that coincide as an interest in mathematics. They do this when they work in small groups to negotiate ideas between each other. The construction of a mural or model by a team or the whole class is a ‘low stakes’ task where students begin to work out methods of collaboration and negotiation with a set of ideas that they wholly own.

This process undergoes further elaboration when students move to Step Three of the Five-Step Curricular Process and then must create, collaborate, and negotiate their ideas about their shared experience verbally in what we refer to as “People Talk.”
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Please contact us c/o ben@algebra.org or call 1-617-491-0200 with any questions.

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