Supporting Black Students in SEM

Sparking Interests in K-12 Education

Elisha Smith Arrillaga, Ph.D.

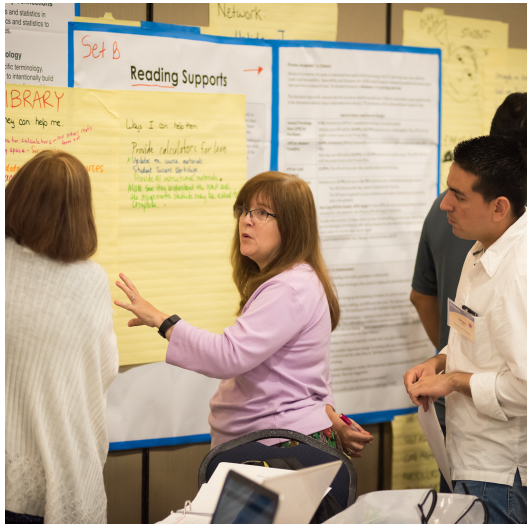
Our Mission

Advancing Public Education at Scale

01 50+ member team works across K–12 and higher education systems

02 Bring lens of equity to ensure every student has access to high-quality, relevant, and modern math & science education that's central to their postsecondary & career success

03 Over 30 years of experience, bringing deep understanding of how to navigate complex educational systems



Our Work

Equity Centered Impact and Innovation K–12 to College

CURRICULUM

High Quality Math and Science Curriculum at Scale

Develop and support culturally relevant, student centered, evidence-based curriculum.

PROFESSIONAL LEARNING

Impactful Professional Development

Provide professional learning that centers students and bridges gaps between K–12 and postsecondary.

POLICY

Policies to Support Math Pathways of the Future

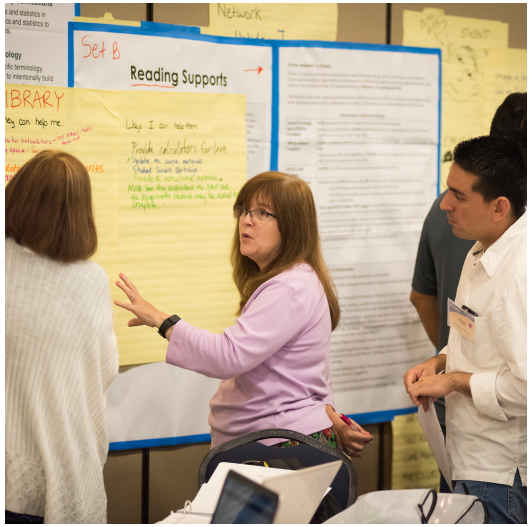
Advance policies to support the mathematics pathways movement and better serve students of color and low-income students.

Overview

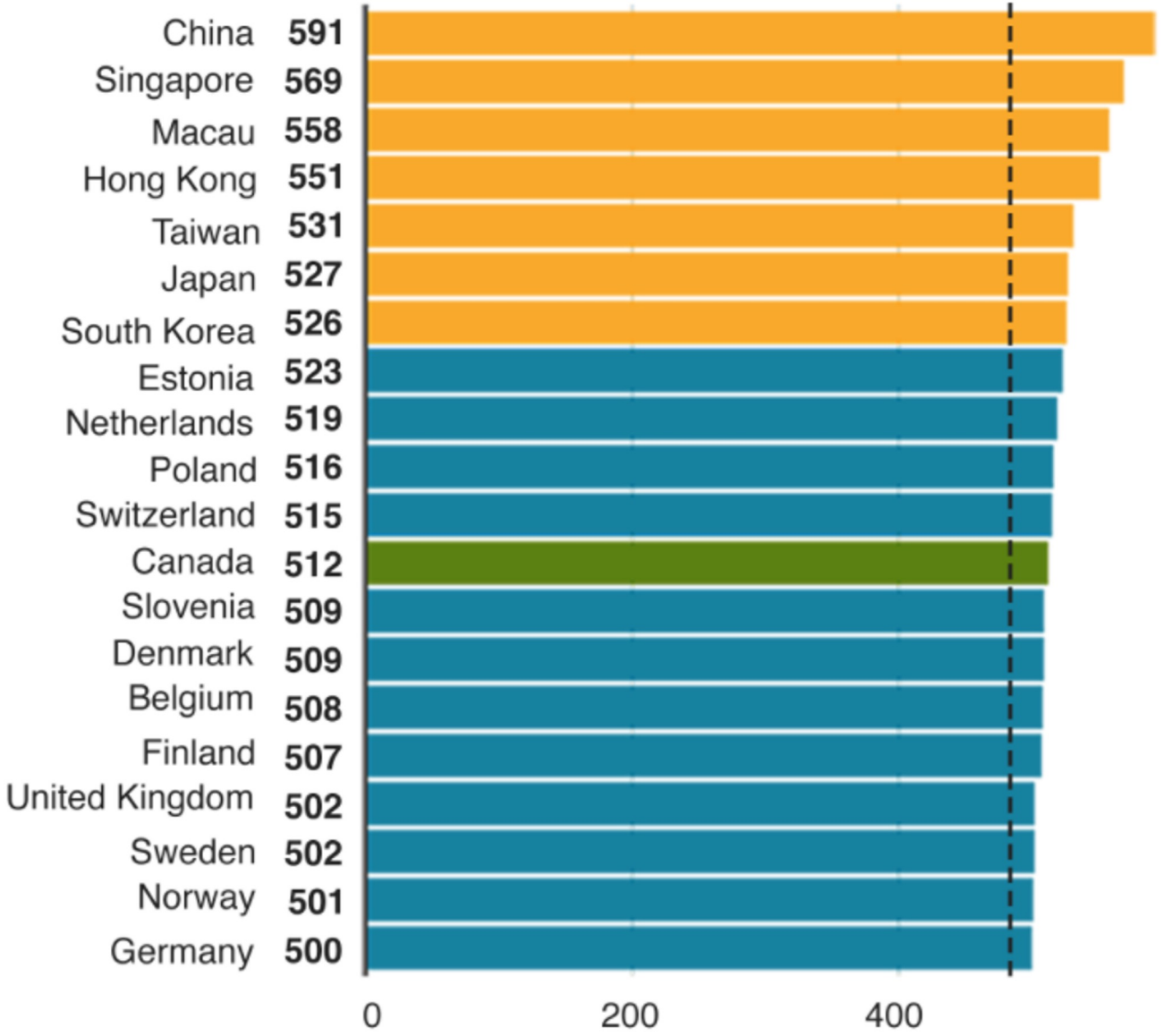
01 Background Data

02 Dana Center Efforts

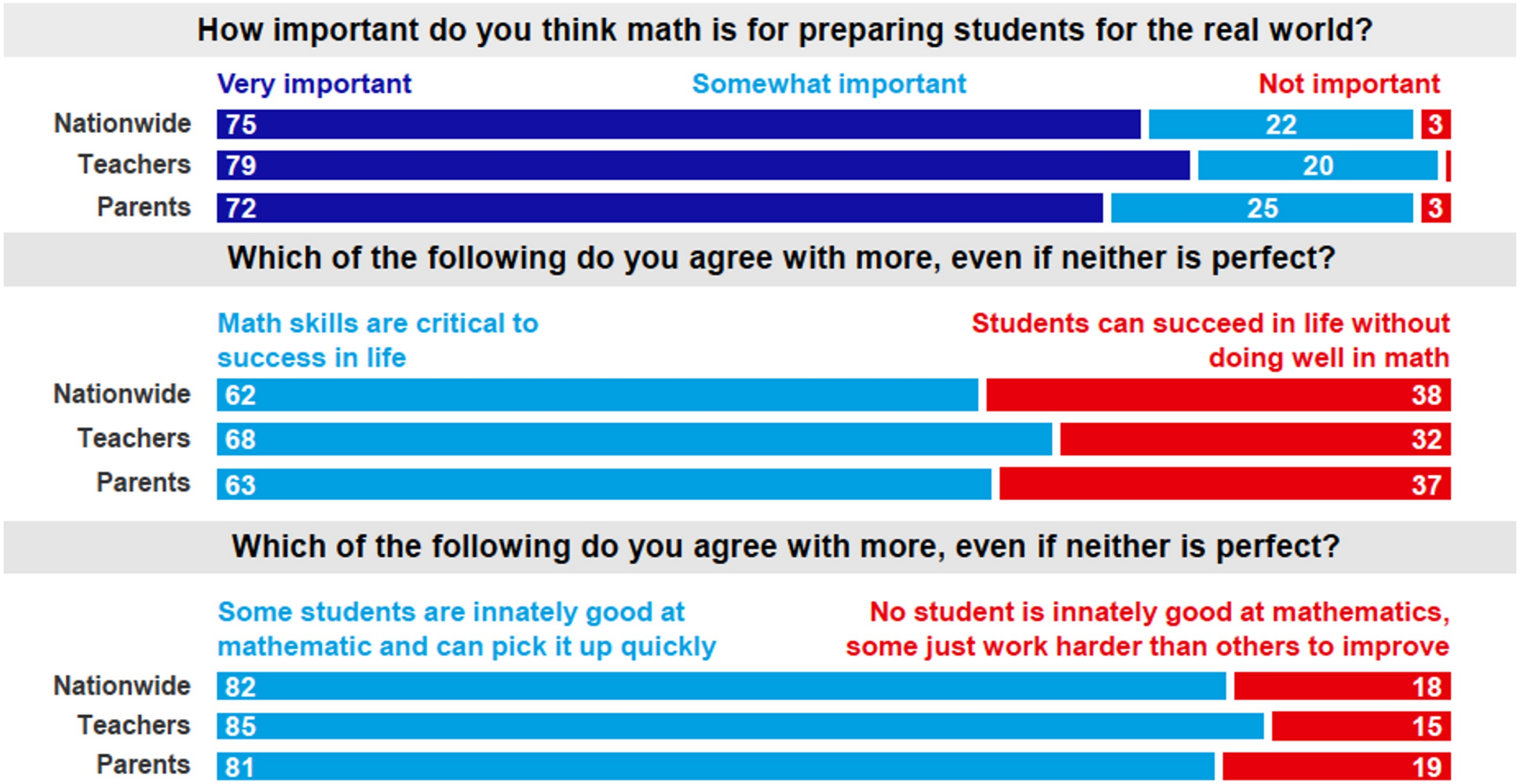
03 Other Important Work



Top 20 countries in math on 2018 Pisa tests

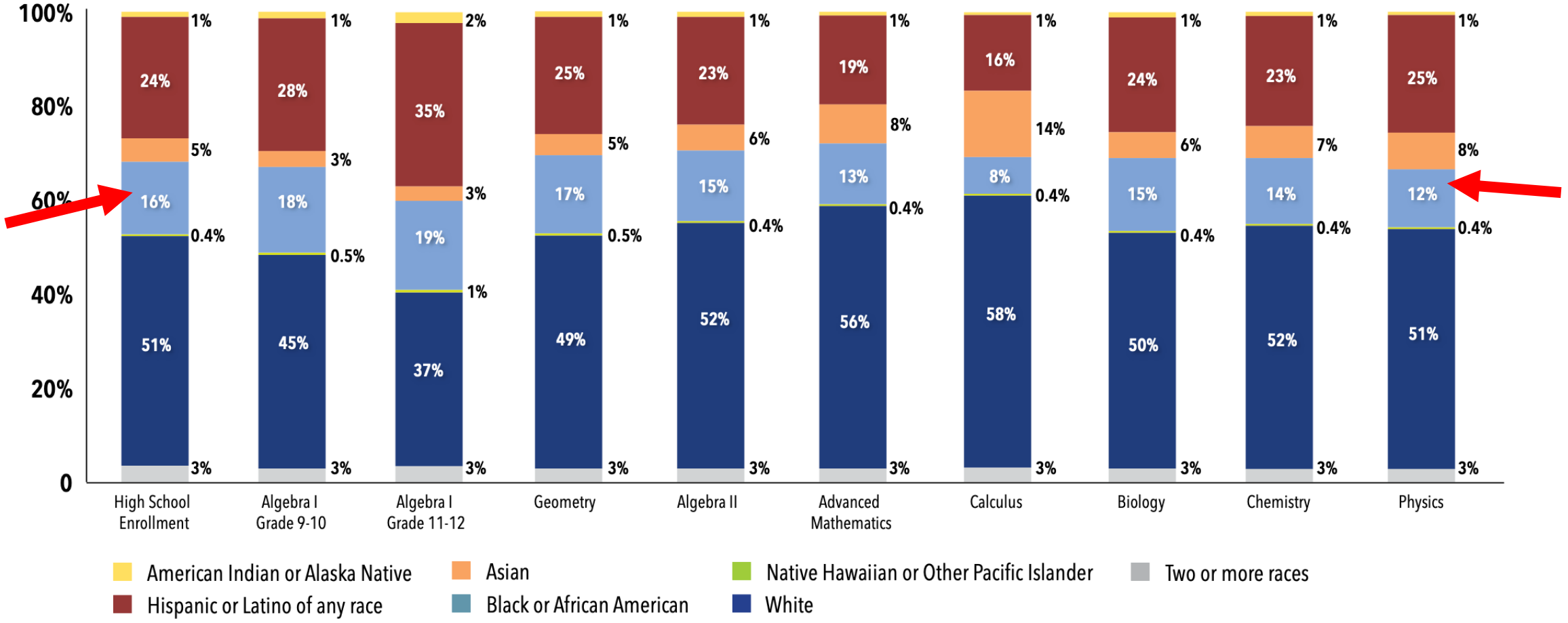


Polls: math is essential — but innate



Source: Global Strategy Group, 2021

FIGURE 7: Percentage distribution of students enrolled in high school mathematics and science courses, by race



NOTE: Data may not add up to 100 percent due to rounding.
SOURCE: U.S. Department of Education, Office for Civil Rights, Civil Rights Data Collection, 2015–16.

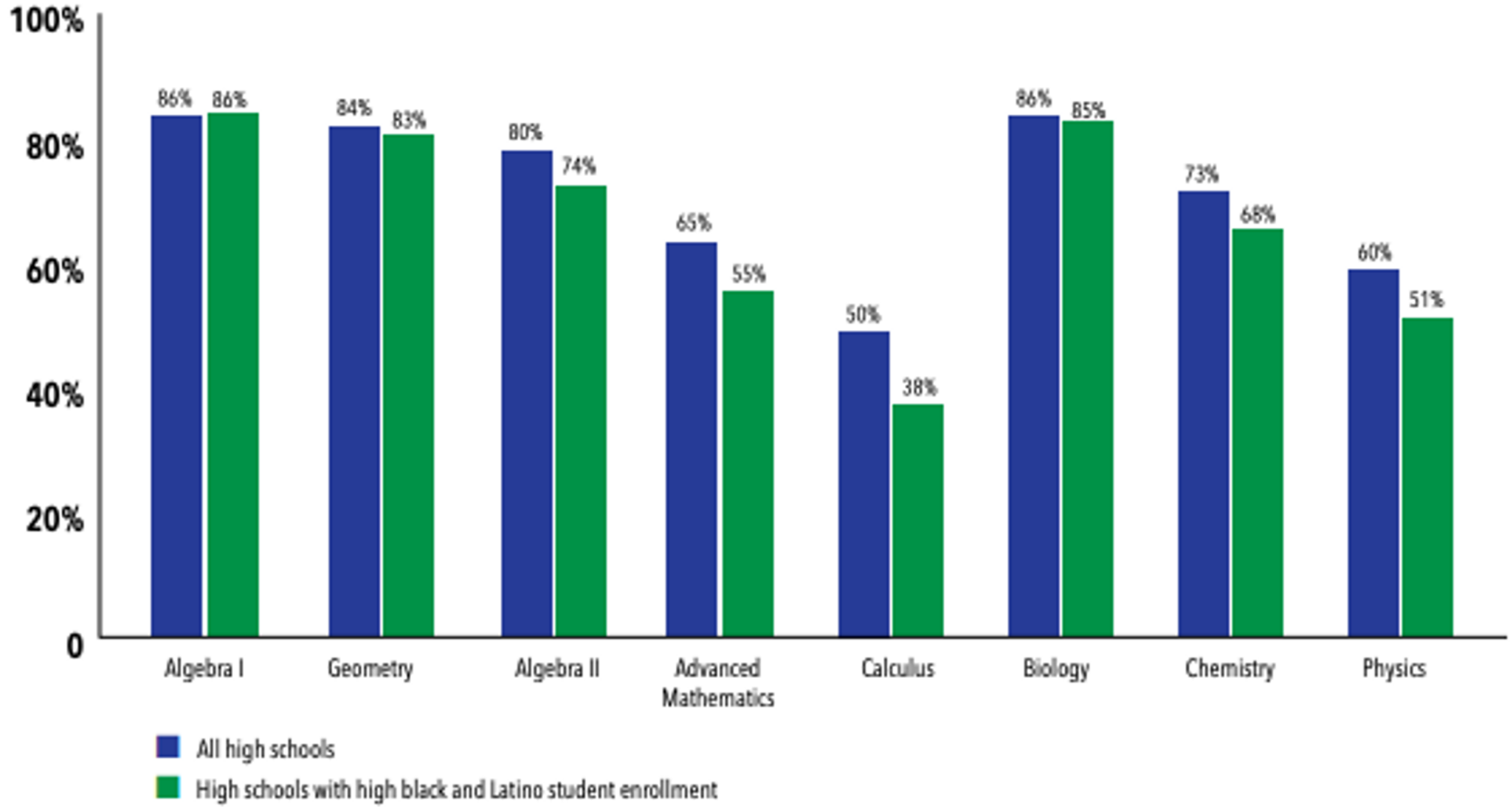
Calculus Attainment of High School Graduates

By gender, race, and income

Source: National Science Board, 2018

*By SES within racial/ethnic group

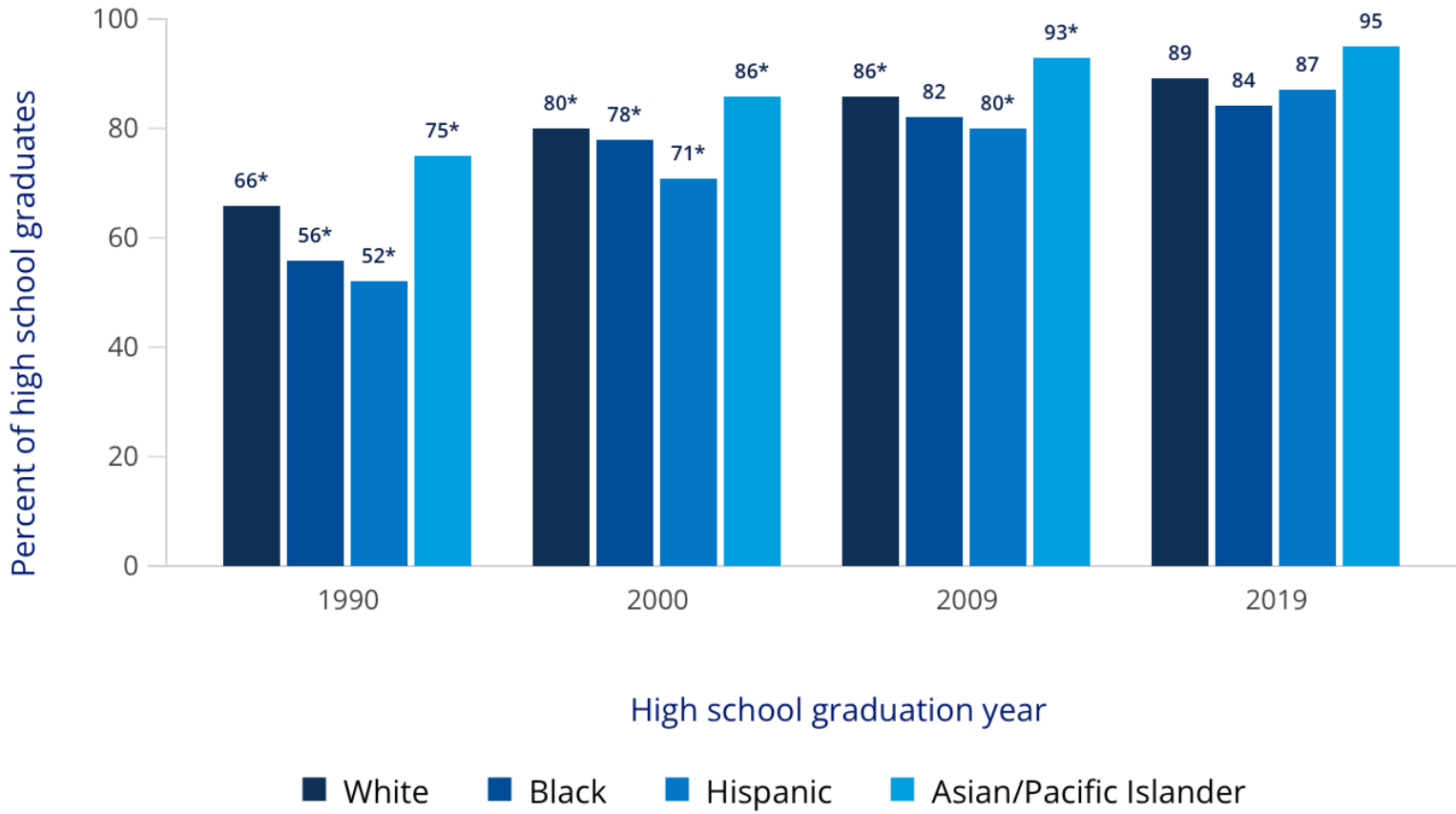
FIGURE 4: Percentage of high schools offering mathematics and science courses



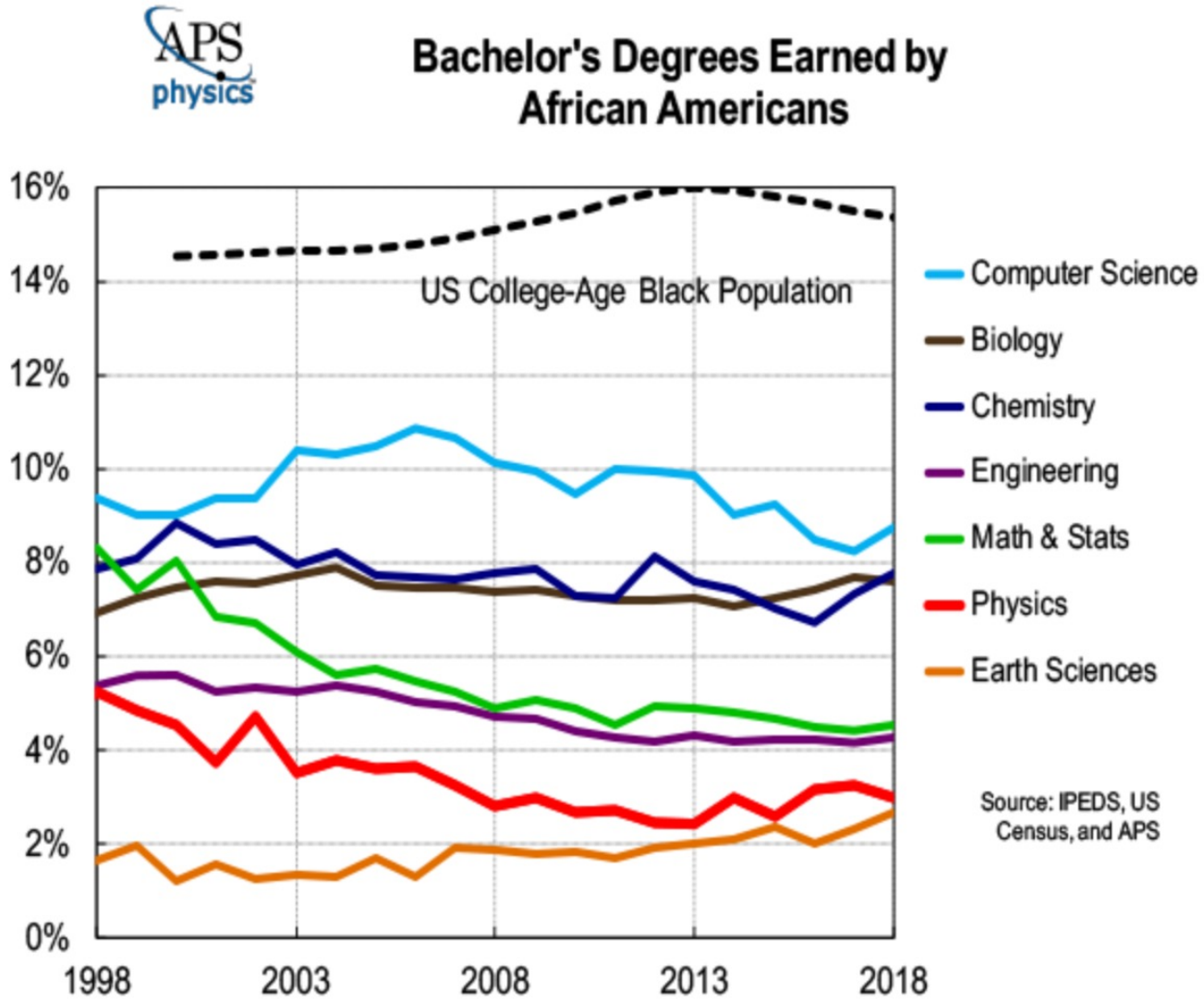
SOURCE: U.S. Department of Education, Office for Civil Rights, Civil Rights Data Collection, 2015–16.

The percentage of high school graduates in 2019 earning credits in STEM advanced science and engineering courses increased for all reported student racial/ethnic groups compared to 1990.

Percentage of high school graduates earning Carnegie credits in science, technology, engineering, and mathematics (STEM) advanced science and engineering courses, by student race/ethnicity: Various years, 1990–2019



Bachelor's Degrees Earned by African Americans, by Major



The Number of Doctorates Earned in Physics, 2014–15 to 2018–19

Number of Doctorates Earned in Physics by People who are:	2014–15	2015–16	2016–17	2017–18	2018–19
American Indian or Alaska Native men	5	0	1	2	2
American Indian or Alaska Native women	0	1	0	0	0
Asian men	56	55	61	66	70
Asian women	17	20	19	18	27
Black or African American men	13	15	16	8	8
Black or African American women	5	9	3	4	1
Hispanic or Latino men	34	40	50	42	40
Hispanic or Latino women	10	5	7	11	10
Native Hawaiian or Other Pacific Islander men	2	1	1	1	1
Native Hawaiian or Other Pacific Islander women	0	0	0	1	0
White men	639	650	648	609	651
White women	135	142	115	165	123
Two or more races men	9	11	11	24	22
Two or more races women	1	8	6	6	6
All Other Race/Ethnicity and Gender Combinations (NonResident Alien and Unknown)	915	889	894	923	914
Totals:					
Non-White Only	152	165	175	183	187
White Only	774	792	763	774	774
Grand Totals:					
Men	1,474	1,489	1,511	1,478	1,497
Women	367	357	321	402	378
All	**1,841**	**1,846**	**1,832**	**1,880**	**1,875**

These data are publicly available from the National Center for Education Statistics (NCES) here: https://nces.ed.gov/ipeds/use-the-data.

Launch Years: A Collaborative Movement for Change

Seamless Transition through "Launch Years"

Launch Years: Reimagining mathematics education and updating policies and practices from grade 11 through first year of postsecondary

Collaborative Approach

Bringing together experts, advocates, and other leaders from K–12, higher education, and business and industry—including 35+ member Consensus Panel

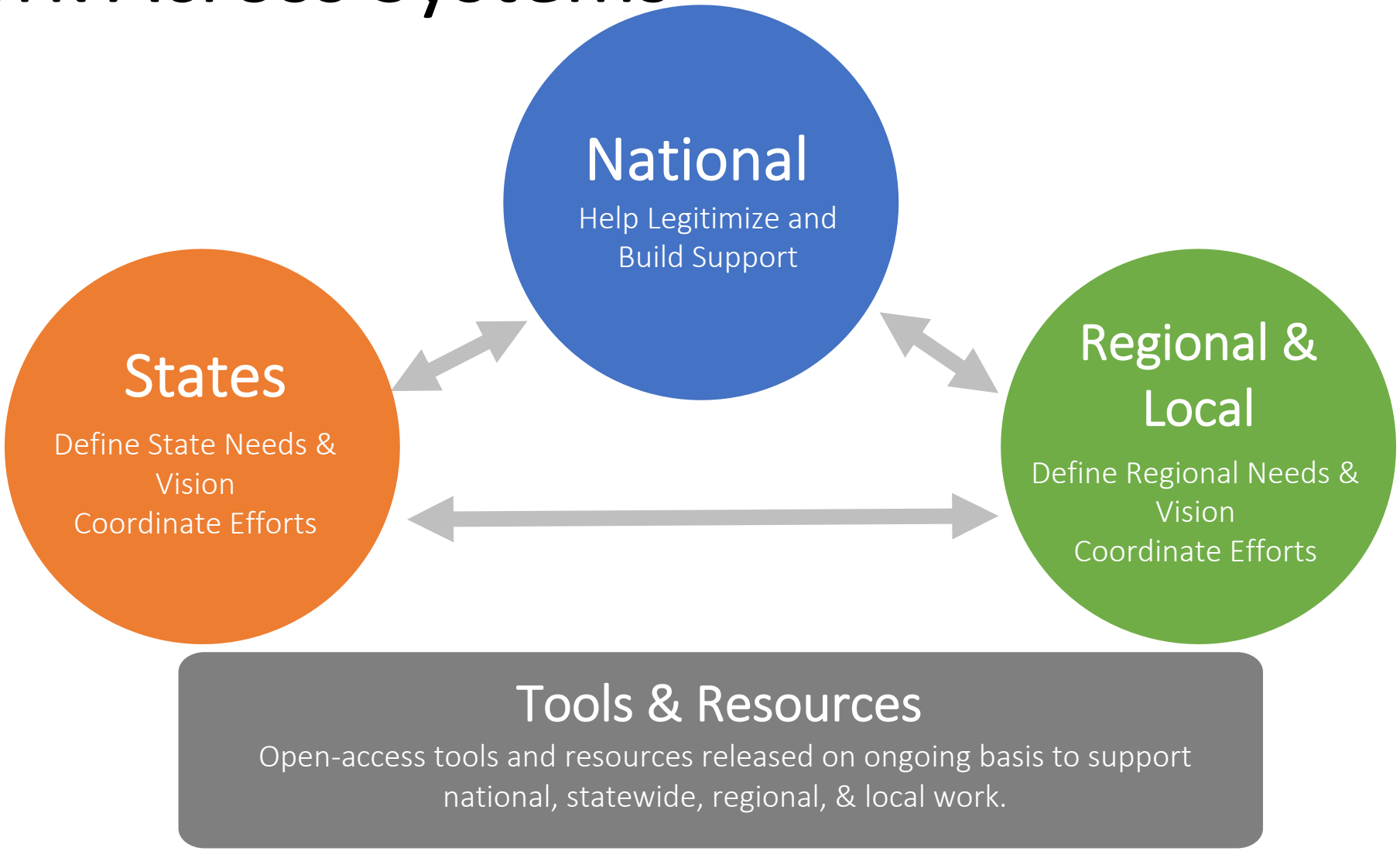
The University of Texas at Austin
Charles A. Dana Center

CCRC COMMUNITY COLLEGE RESEARCH CENTER
TEACHERS COLLEGE, COLUMBIA UNIVERSITY

ESG Education Strategy Group

Association of Public & Land-grant Universities

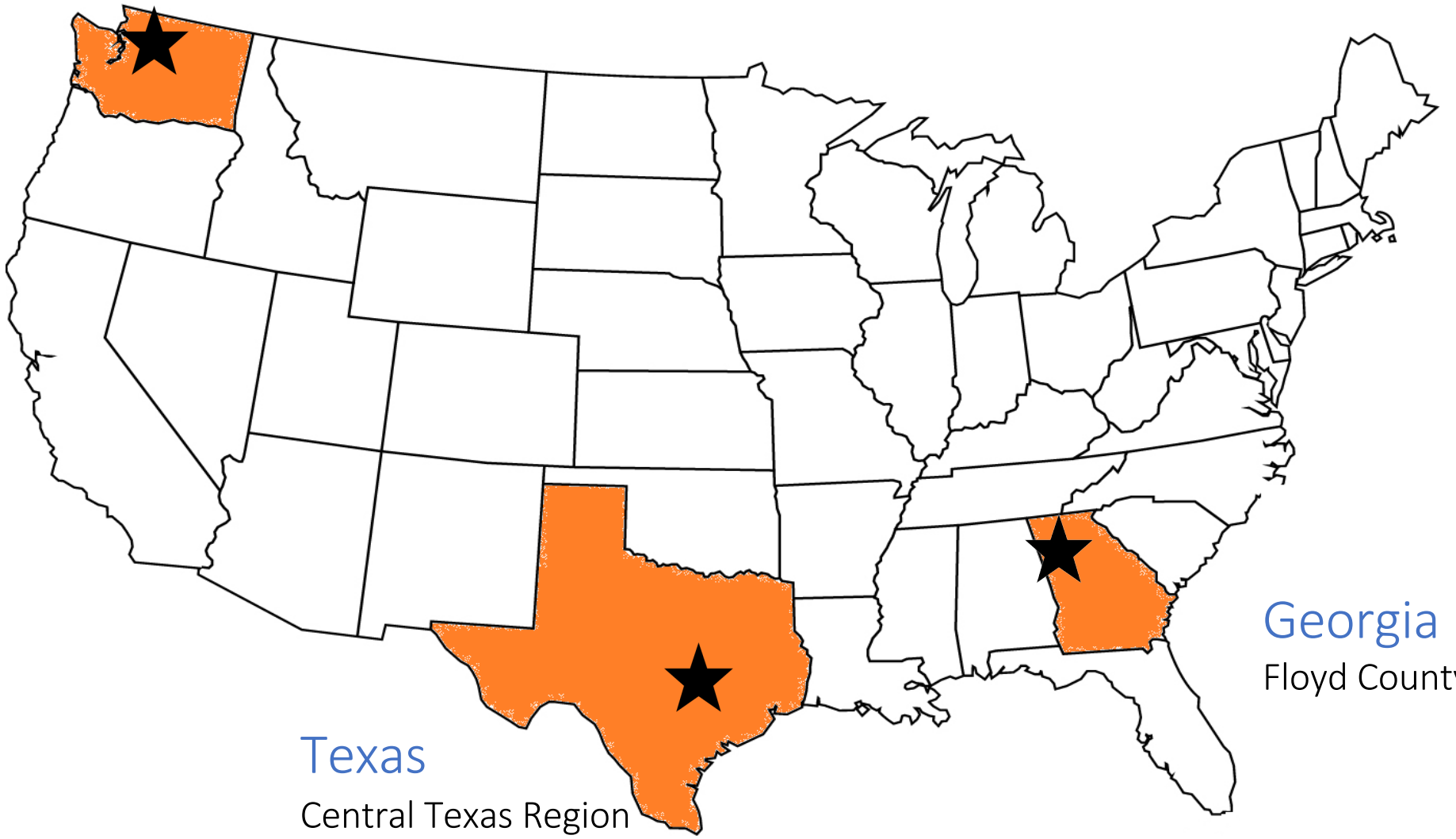
Work Across Systems



Initial Focus of On-Site Work

Washington

Spokane Region



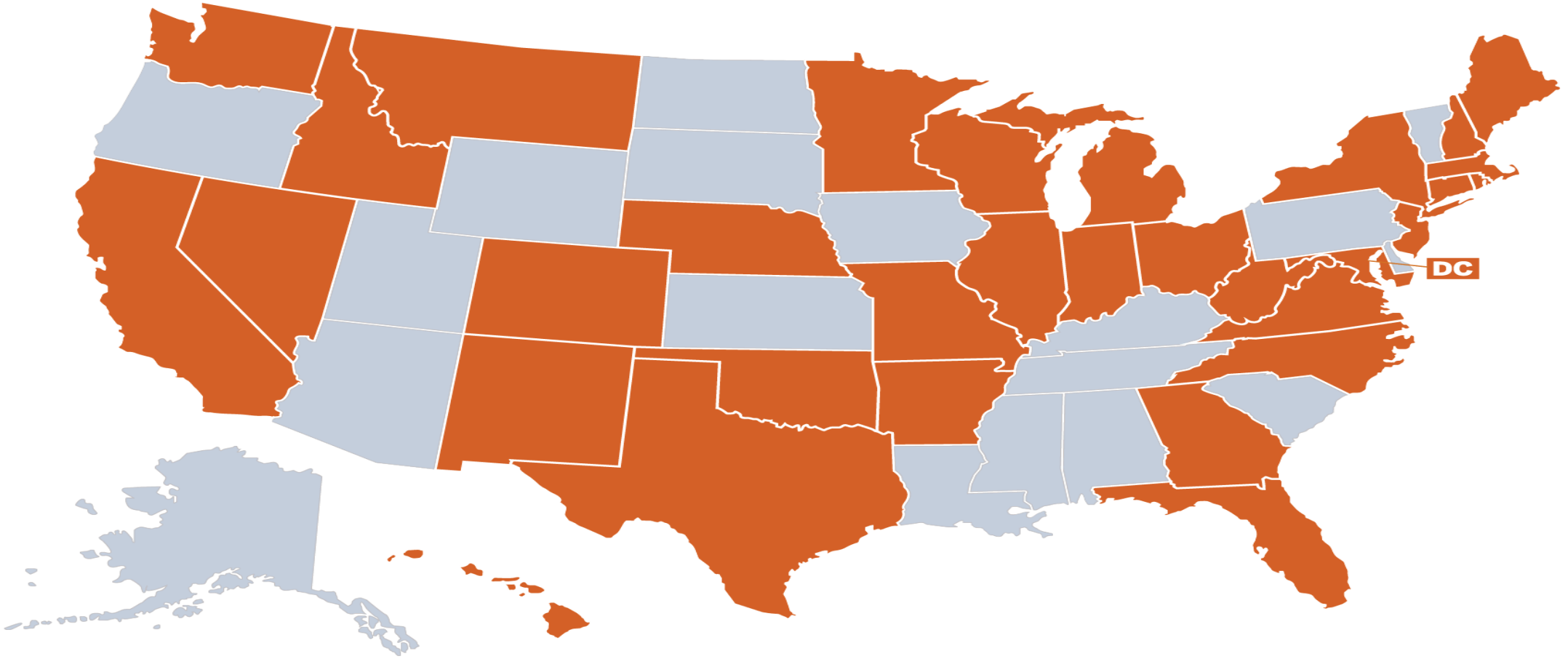
Texas

Central Texas Region

Georgia

Floyd County Region

Work with the Conference Board of Mathematical Sciences



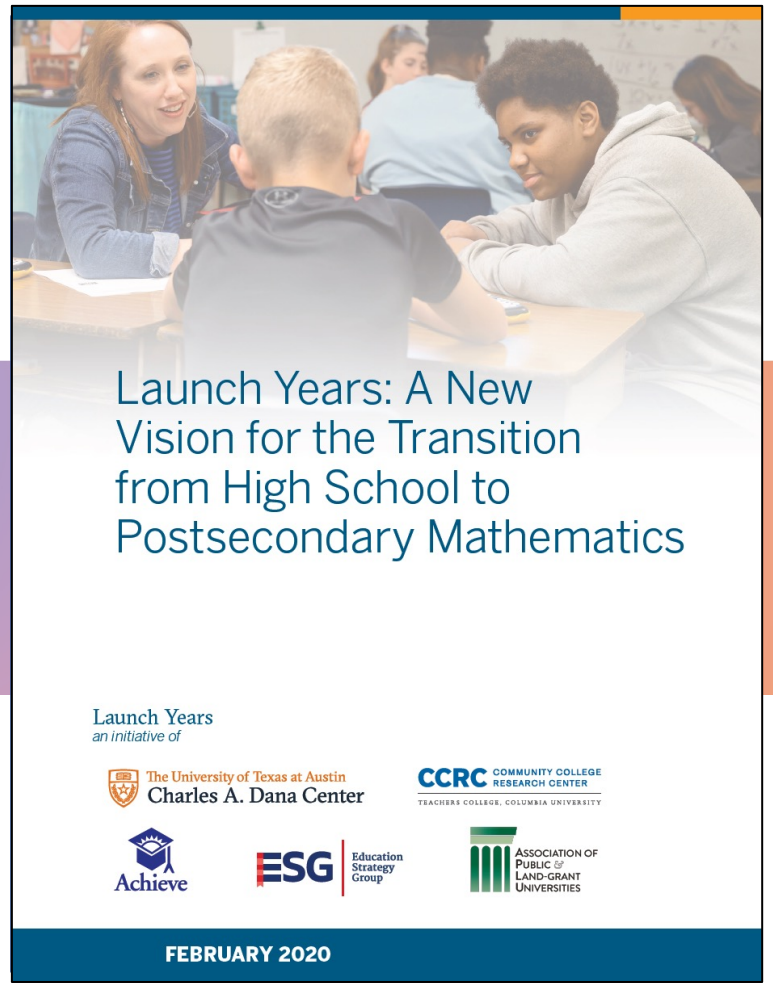
Dana Center Mathematics Pathways

Launch Years Report

A wide-ranging report exploring key barriers, opportunities, and recommendations for actions we can take to mobilize Launch Years work.

Launch Years: A New Vision for the Transition from High School to Postsecondary Mathematics

Learn More & Download at:
UTDanaCenter.org/launch-years



FAMILY ENGAGEMENT FOR EDUCATIONAL EQUITY BUILDING BLOCKS FOR SCHOOL SYSTEMS

Educators and school district administrators have a significant role to play in breaking down barriers to family education. The following steps articulate activities and actions educational leadership can take, in partnership with family organizing groups, to advance along each phase of the spectrum.

Inform	Provide families & communities with relevant information regarding current inequities and plans to address them
Consult	Seek input from students, parents/families, and the community to inform solutions to address educational inequities. Provide information as to how decisions & plans are made
Involve	Promote family participation in school site councils to ensure student, parent, community needs are met; Open up clear decision-making channels for participation in crafting solutions
Collaborate	Partner directly with parent groups, student groups, and/or community orgs focused on educational equity to design and implement solutions; Allow room for change/adjustment
Defer To	Foster community ownership of educational equity by co-developing community schools that serve as hubs for a holistic approach to educational success & community well-being

Home - The Hidden Genius Pro

hiddengeniusproject.org

Join Our Team: Now Hiring at Multiple Positions LEARN MORE

THE HIDDEN GENIUS PROJECT

ABOUT PROGRAMS GET INVOLVED CAREERS NEWS DONATE

The future looks like me

We build pathways for young women of color to embrace the current tech marketplace as builders and creators by introducing them to skills in computer programming and technology.

Radical action is needed if we are to close the opportunity gap for Black women and girls. We lead a global movement to establish equal representation in the tech sector. Black Girls CODE is devoted to showing the world that Black girls can code and do so much more. Together, we are creating stronger economies and more equitable

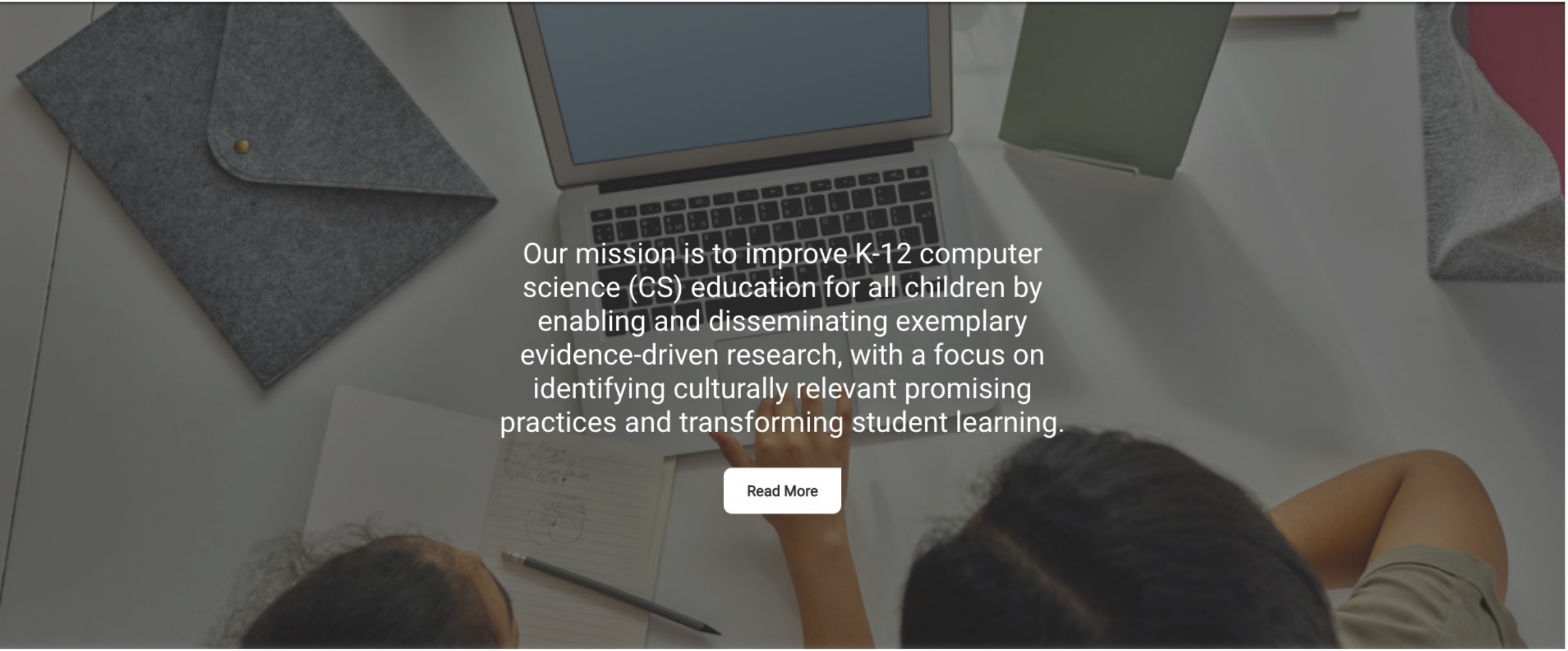
Home - HYPE | Home - CS Education Research

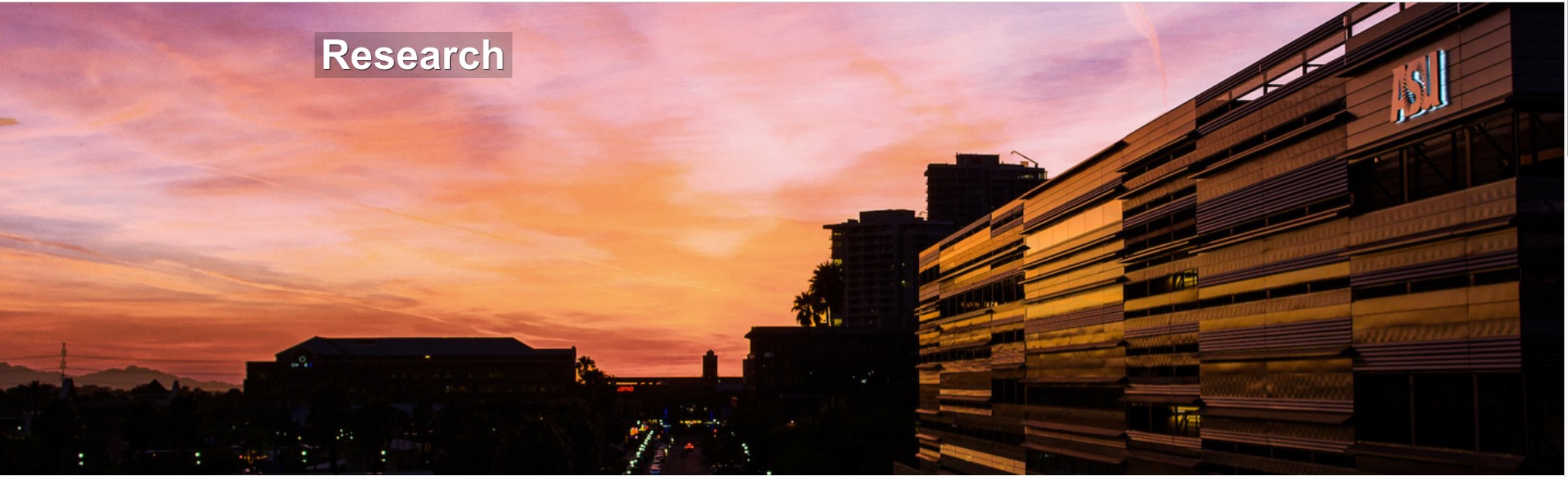
csedresearch.org

About | Blog | Contact Us

csedresearch.org

Community Resources | Current Projects | Our News | Our Services | DONATE





COMPUGIRLS: A Culturally Relevant Technology Program for Girls

Website

http://sst.clas.asu.edu/compugirls

Summary

Arizona State University (ASU) in collaboration with Phoenix Union High

KAPOR CENTER

REIMAGINING EQUITABLE COMPUTER SCIENCE EDUCATION

Explore our Framework

ESTABLISHING A MORE JUST, ACCESSIBLE, & EQUITABLE COMPUTER SCIENCE EDUCATION FOR ALL STUDENTS

The Equitable CS Curriculum Initiative is a multi-year endeavor designed to create engaging computer science education experiences for children and youth in grades K-12. We will achieve this through intentional and collaborative efforts that dismantle racism

SMASH Home - SMASH

smash.org

Ascend to the 2022 SMASH Summit! Learn More

SMASH

ABOUT PROGRAMS IMPACT GET INVOLVED DONATE

PROGRAMS

HYPE

We empower girls of color with technology skills and prepare them to become future leaders in tech careers, cultivating a pipeline of diverse talent for the tech industry

Learn More

CALL FOR PROPOSALS

2022 National We the People Math Literacy For All Conference

We are seeking proposals for workshops, interactive discussions and presentations that fit within one or more of the following areas:

- Events and work that honors and advances Bob Moses's legacy.
- Forums for young people and teachers to share their ideas and present their real demands for money, structures, and resources that will allow them to be successful in teaching and learning mathematics.
- Sessions designed by young people and teachers that demonstrate success and share useful practices that support math literacy.
- Highlights of practitioner-researcher collaborations currently in process in both informal and formal learning settings.

The Alliance encourages all those interested to submit a proposal to present and/or lead a session/workshop.

PROPOSALS DUE BY: APRIL 7TH

VIRTUAL CONFERENCE: JULY 28TH & 29TH

We the People Math Literacy for All Alliance (WTP-ML4A) in collaboration with the Algebra Project, Inc is excited to announce a July 2022 virtual planning and working conference celebrating and seeking to steward the vision and work of Bob Moses, with the engagement of the WTP-ML4A Alliance participants, allies, and the public.

WTP-ML4A is committed to a country where everyone is fully literate in mathematics and every student is provided a rich, structured, and engaging opportunity to experience mathematics as a meaningful, joyful, and creative human activity. The Alliance views mathematics literacy as necessary to participate fully in our democracy.

We are looking for young people and teachers to share their ideas and present their real demands for money, structures, and resources that will allow them to be successful in teaching and learning mathematics. There will also be opportunities to showcase current and planned direct work with schools and districts and their collaborators in formal and informal learning settings.

ALGEBRA PROJECT

We the People

A National Alliance

Math Literacy for All

Privacy - Terms

SO WHATS INSIDE?

Confidence, Creativity, and Real-World Math!

Each box contains:

- A foundational math lesson/activity booklet based on a real-world theme to show relevance and create excitement
- 3-5 items (including at least one Screen-Free activity or manipulative) to bring the theme to life (Items will differ from month-to-month)
- An affirmation to strengthen her math confidence
- A profile of a woman mathematician to show representation that develops your girl's math identity (her ability to see herself as a learner and doer of math)
- A Caring Adult Guide to help YOU help her maximize her box experience (you do NOT have to be a math whiz to help her enjoy the Black Girl MATHgic Box! Commitment is all you need.)

Children learn and retain information better when they feel more comfortable and able to apply that information to their own lives. That's why the Black Girl MATHgic Box aims to keep our girls growing and learning math with real-world themes connected to her lived experiences.

To Learn More…

Elisha Smith Arrillaga

elisha.smitharrillaga@austin.utexas.edu

@ESArrillaga

UTDanaCenter.org

Facebook.com/utdanacenter

Twitter.com/utdanacenter