

CALL TO ACTION
FOR SCIENCE
EDUCATION

BUILDING
OPPORTUNITY
FOR THE FUTURE

A New Vision for Science Educators

High-quality science education is not the national priority it needs to be. There are also deep disparities that have shut too many students out of science learning and careers.

The National Academies of Sciences, Engineering, and Medicine convened a committee of experts to present a detailed vision of better, more equitable science learning from kindergarten to postsecondary education, and to outline recommendations for how policymakers can achieve this vision.

ADDRESSING CHALLENGES IN TEACHING SCIENCE

A cultural and pragmatic shift is long overdue to elevate educators as skilled and respected professionals. Teachers are at the center of solving many of the pressing issues affecting science learning for students, and they are the engines to create a better, more equitable system. Therefore, educators' needs, experiences and insights should be leveraged to inform sound science education policy.

PROVIDE AMPLE PROFESSIONAL LEARNING OPPORTUNITIES AND RESOURCES FOR A WELL-PREPARED K-16 SCIENCE TEACHER WORKFORCE

Why it matters:

- In a recent national survey, the majority of elementary teachers (69%) reported they are not very well-prepared to teach science.
- Scores of secondary teachers say they are not very well-prepared to teach many topics related to their disciplines.
- Lack of teacher preparation is more acute in schools that serve higher percentages of students of color and students living in poverty, furthering science education disparities.

Professional learning opportunities for teachers are an essential part of ensuring high-quality science instruction and educators should feel well-prepared to teach science topics. K-16 teachers need ample, ongoing opportunities to participate in professional learning focused specifically on science pedagogy and to engage in professional communities to share best teaching practices, troubleshoot challenges and receive and provide feedback.

How to make it happen:

- Offer professional learning opportunities that are consistent, closely connected to the curriculum being taught and allow time for reflection.
- Devote the same measure of professional development resources, including time, to science as the other disciplines.
- Focus on teaching student-centered instructional approaches that reduce reliance on lectures.
- Provide time, materials, and resources for science instruction.

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SOURCE: Horizon Research, Inc. (2019).
Highlights from the 2018 NSSME+.

INCREASE AND RETAIN DIVERSE SCIENCE TEACHERS

Why it matters:

- Eight of 10 public elementary, middle school, and high school science teachers are White.
- Teachers of color are more likely to work in schools that are in high-poverty, urban communities and they are more likely to change schools or leave the profession than White teachers.

With a predominantly White science educator workforce, students of color are denied role models which are linked to driving a greater effort in school and fostering higher education goals. Concentrated efforts should be made to attract and retain teachers of color who experience higher rates of turnover which are likely tied to poor working conditions in underresourced schools.

How to make it happen:

- Support efforts that strengthen pathways for individuals from all backgrounds to become STEM faculty.
- Create community incentives and programs to invite Black, Latino/a and Indigenous teachers into the profession and then take intentional steps to ensure they feel welcome and valued, with a focus on improved working conditions.

VALUE TEACHERS AS THE SKILLED PROFESSIONALS AND PRIORITIZE THE TEACHER VOICE IN SCIENCE EDUCATION POLICY

Teachers should feel respected as professionals in the field. The education sector should treat teacher experiences and input as valuable insight into the state of science education.

How to make it happen:

- District and state policymakers should prioritize solving the underlying issues leading to science teacher shortages and retention issues.

Fulfill the Need for K-12 Science Teachers

Starting in preservice, K-12 teachers need opportunities to learn about, try out, and refine instructional strategies for engaging students actively in science. These instructional strategies require a different set of skills and knowledge than traditional lecture and text-based approaches, so even veteran teachers may need additional learning opportunities.

Attracting and retaining more science teachers of color is a top priority for all levels of education. For example, many efforts are working to strengthen pathways for more diverse people to become STEM faculty. Communities need to create incentives and programs to invite Black, Latino/a and Indigenous teachers into the profession and then take intentional steps to ensure they feel welcome and valued. This will likely need to include attention to the working conditions in schools.

The Call to Action committee has provided clear, actionable recommendations for federal and state lawmakers, education leaders, advocates and local communities. To learn more, visit nationalacademies.org/cta-science-education.