

# High School Science & Math as an Entry Point to Engineering

High school coursework in science and math has been shown to increase students success in college STEM courses, degree attainment, and can have a significant impact on lifetime earnings. Yet, few high school graduates in the U.S. enter college with that experience. College and university faculty can play a valuable role in informing high schools of the problem and encouraging action.

## Key coursework in high school to lead to engineering programs:

**Science:** Biology, chemistry, & physics are all required for most STEM 2- and 4-year degrees as well as trade programs, yet only 36% of students had those classes in high school.

**Math:** Precalculus & calculus have even lower high school enrollments (13% and 6.5%) while Calculus 1 is the major roadblock for early STEM majors. ([from the National Center for Education Statistics](#))

Significant *enrollment gaps by gender, race & ethnicity, and household income* further limit which students graduate high school prepared for a career in engineering.

## Effective interventions

### Advocate for default enrollment into key courses

For example:

- A student passing biology is enrolled in chemistry next year
- A student passing Algebra 2 is enrolled in precalculus next year

### Advocate for extra support for 7th grade math students

[The Calculus Project](#) is a model for 7th grade math support, offering summer programs for students between 7th and 8th grade to prepare for Algebra 1 and placing them on track to take Calculus in 12th grade.

### Start *local* conversations

- Talk to your local high school science and math teachers
- Meet with an Assistant Principal, Guidance Chair, Science or Math chair, or District Science Supervisor
- Don't forget Title 1 schools (those in low-income areas)
- Draft a letter of support signed by local college/uni leadership, [like this one](#).

### At the *state* and *federal* levels

- Ask to make chemistry and physics graduation requirements in your state
- Ask to make your state's student enrollment data easily accessible to the public
- Include these as recommendations for HS students interested majoring in Engineering at your uni
- Pursue funding for teacher support in chemistry, physics, precalculus, & calculus
- Pursue funding for student support in 7th grade to increase 8th grade Alg 1 enrollments