

## Executive Summary: Math & Science Best Practices

Laclustering math and science performance among Texas and United States students has highlighted the need for reform in math and science education. Fortunately, a number of Texas high schools are shining examples of places where students are achieving success in math and science. The goal of this paper is to help other school districts and campuses learn from these examples by offering a best-practices model for student achievement in math and science.

Using standardized test and college entrance exam data from the Texas Education Agency (TEA), we identified 39 schools that not only score well in math and science, but have also demonstrated significant gains over time. We surveyed, interviewed, and visited these schools, gathering data and anecdotes about teacher characteristics, school schedules, parental involvement, and numerous other variables. We supplemented this information with statewide data from the TEA, and compared the high-performing high schools with Texas public schools as a whole.

Various patterns, or best practices, emerged. Our findings include the following:

- School choice—through options such as magnet schools—appears to have a positive effect on student motivation, parental involvement, and discipline.
- Best practice schools spend less money per student, but a larger percentage of resources on instruction and school leadership.
- The top schools have larger math and science classes than the state average, thus allowing them to pay higher teacher salaries and potentially mitigating the teacher shortages found in other public schools.
- Almost all science teachers in best practice schools have a degree in the sciences, and these schools attract teachers from industries such as accounting, engineering, and higher education.
- A large portion of best practice schools provide stipends to attract math and science teachers, and several of the schools offer incentive pay on an individual teacher basis.
- Best practice schools target TAKS preparation on low-performing students, thus minimizing its impact in the classroom.
- A large percentage of the highest-performing schools utilize a block schedule, which may be especially conducive to some math and science classes.
- Best practice schools encourage parent involvement through frequent communication from teachers and even online access to students' grades.

Based on these findings, we propose the following recommendations to educators and policymakers:

- Create schools of choice, perhaps focusing on math, science, and related fields, that allow students and parents flexibility within school districts.
- Remove barriers that discourage industry experts from entering the teaching field.
- Focus financial resources on instruction.
- Consider raising class sizes in order to increase teacher salaries and decrease teacher shortages in math and science.
- Utilize stipends and incentive pay with the goal of increasing the supply of quality math and science teachers.
- Minimize TAKS infringement on classroom time by focusing TAKS preparation on low-performing students and outside of the regular classroom.
- Consider offering incentives for successful participation in Advanced Placement (AP) or International Baccalaureate (IB) tests.
- Utilize student data, especially value-added data, for activities such as student and teacher goal-setting, curriculum modification, and teacher evaluations.
- Engage parents with frequent communication from teachers; consider implementing a real-time, online grade-checking program for parents and students. 