



# **COMPETITIVE PRIORITY**

**Science, Technology, Engineering,  
and Mathematics (STEM)**  
**(15 total points)**

**Priority 2: Competitive Preference Priority -- Emphasis on Science, Technology, Engineering, and Mathematics (STEM). (15 points, all or nothing)**

To meet this priority, the State’s application must have a high-quality plan to address the need to (i) offer a rigorous course of study in mathematics, the sciences, technology, and engineering; (ii) cooperate with industry experts, museums, universities, research centers, or other STEM-capable community partners to prepare and assist teachers in integrating STEM content across grades and disciplines, in promoting effective and relevant instruction, and in offering applied learning opportunities for students; and (iii) prepare more students for advanced study and careers in the sciences, technology, engineering, and mathematics, including by addressing the needs of underrepresented groups and of women and girls in the areas of science, technology, engineering, and mathematics.

*The competitive preference priority will be evaluated in the context of the State’s entire application. Therefore, a State that is responding to this priority should address it throughout the application, as appropriate, and provide a summary of its approach to addressing the priority in the text box below. The reviewers will assess the priority as part of their review of a State’s application and determine whether it has been met.*

*Recommended maximum response length, if any: One page*



## **Science, Technology, Engineering, and Mathematics (STEM)**

This proposal integrates and expands upon the most innovative STEM work currently underway in New Jersey and proposes additional initiatives, as outlined in Section (D)(3). Our goals are to improve the delivery of higher-level content in the classroom, to provide more students in high-needs districts with access to challenging STEM coursework, to recruit more alternative-route qualified math and science teachers, and to subsequently provide more STEM career options for the students of New Jersey. We will measure the student-level impact of our STEM initiatives as an increase in the number and diversity of students taking STEM classes and taking AP exams in STEM subjects. We will measure the human capital impact of our STEM initiatives as an increase in the number of STEM teachers in the state, and the measured effectiveness of those teachers.

One of our priorities has been providing our classroom teachers with high-quality materials to support the teaching of STEM subjects. New Jersey revised Science and

Technology standards when they revised their core curriculum content standards released in February 2010. There are brief excerpts of standards and lesson plans available in Appendix II to illustrate the resources that we have created. Mathematics will be revised as a result of New Jersey's participation in the Common Core. A key tenant of this work involves an effort to make these standards reflective of 21<sup>st</sup> Century Skill sets. The lesson plans will be improved and expanded upon as we develop the curriculum spine described in (B)(3).

To integrate the STEM work that is contained in the assurances, and to develop a statewide collaboration for STEM, we intend to create and convene a STEM Council. The Council will be responsible for refining the strategic vision for STEM work and planning for additional resources to support teachers and students. We envision a committee that contains representatives from higher education, research, industry, education, affiliated education groups, other state agencies, and decision-makers. This council will create and support a unified vision for STEM work in the State of New Jersey.

As described in (D)(3), New Jersey is home to many industries that employ STEM graduates; there is therefore keen competition for the best minds who may be interested in STEM-related careers; and New Jersey has proposed the following measures to build interest and understanding in teaching STEM:

- We will expand and adapt the successful Progressive Science Initiative—currently teaching algebra-based physics to 1,200 children in Newark, Jersey City, and Paterson—to biology and chemistry.
- We will expand and adapt the successful Traders to Teachers program to include a broader recruitment effort, and to continue exploration of alternative routes to certification under this legislation in order to meet the high demand for STEM-certified teachers in high-needs districts.
- We will expand access to online STEM coursework in high-needs LEAs. Challenging STEM content that is delivered virtually will allow a much broader range of students to gain access to the content, without requiring a

highly-effective STEM-certified teacher to be physically present in the classroom.

- We will give students access to hands-on STEM experiences through summer programs with a STEM teaching focus, and offer students a greater understanding of STEM-related careers, both in education and beyond.
- We will continue to expand our collaborations on STEM issues in the areas of CTE, and in order to better prepare students to work within state industries. We are providing professional-development seminars for academic and CTE teachers; and offering CTE courses that count for academic credit using both the Math-In-CTE model and the creation of courses such as construction geometry; and the creation and use of AP courses in CTE programs of study. All of these strategies support our goal of providing access to higher-level STEM content and solid STEM instruction. We will find ways to strengthen the skill-development of New Jersey's high-school students even further to prepare them to work in New Jersey's STEM career pathways.

Finally, to prepare more students for advanced study and careers in mathematics, we will build broader real-world STEM experiences for teachers and students, both in the classroom and beyond brick-and-mortar settings.

There is copious evidence to support the work that we have done to date on STEM, but it could only be briefly excerpted for purposes of this proposal. New Jersey is truly a leader in STEM activities, has strong partnerships with organizations promoting STEM education in the state, and works with teachers to ensure that strong STEM content is available in the classroom.

The initiatives that are proposed within this document will only make us stronger as we endeavor to equip a larger proportion of our students with a confidence and love for STEM-related work.