

## **2015-2016 K-12 Mathematics and Science Partnership (MSP) STEM 1 Year Grant Narrative: Palm Beach County STEM Integration Project**

**Project Summary:** Recognizing the critical importance of STEM education, the School District of Palm Beach County and the University of Florida have created a partnership to position the school system as a state and national leader in STEM education. The **general purposes** of this proposal are to expand the current STEM professional development opportunities already encompassed by the partnership; strive to enhance the content/pedagogical content knowledge of K-12 teachers; and connect STEM teachers with scientists, mathematicians, and engineers to explore real world STEM work and careers. **The specific goals** are to implement: 1) year-long instructional coaching training; 2) year-long STEM lesson study; 3) week-long residential summer institute at UF; 4) 4-day summer institute (in Palm Beach) and 5) STEM content clinics. A culminating district-wide STEM Conference is also planned.

The most **rigorous** and sustained learning opportunities are those which require year-long commitments. The coaching training comprises a 4 day summer institute followed by 6 sessions during the school year in which participants practice coaching conversations, design observation instruments, and collect observation data. The training ends with a portfolio presentation which includes written artifacts and a video of a coaching session. In the year-long lesson-study component, elementary teachers implement STEM lessons obtained from CPALMS or other sources. They collect student achievement data in lessons they personally implement, observe others implement lessons, and actively participate in “working on their work” through the use of protocols (e.g. consultancies or tuning protocols). Residential week-long institutes led by the University of Florida Center for Precollegiate Education and Training (CPET) provide opportunities for 25 elementary STEM teachers and 25 secondary science teachers to work bench-side with UF researchers and experience real-life STEM activities. In addition to STEM

content, participants will collect STEM career information, which they can then convey to their students. Another four-day summer institute is offered in Palm Beach where facilitators model interdisciplinary teaching for mathematics teachers. Teachers then use the district's scope/sequence to integrate other grade-level standards with MAFS ones. Additionally, three "content clinic" components will be held for teachers who are unable to make year-long or summer commitments. These clinics emphasize one aspect of STEM teaching as problem-based learning; project-based learning using the engineering design process; and technology integration. Finally, the STEM Conference will provide a venue for participants in all components to share their learning with teachers throughout the district.

The project's components align with Goals 1, 2, and 4 of the Florida Strategic Plan as they target enhancing teacher effectiveness at high-minority, high-poverty, and/or low performing schools in order to provide students with high quality efficient services. The significant outcome and contribution of the grant will be to enhance STEM teaching and learning within the district. The rationale for the project is based upon research which has shown: 1) teacher quality is the single most important factor in determining student achievement (Rockoff, 2004); 2) Teachers need cutting edge content knowledge (Johnson, 2007; Committee on Integrated STEM Education, 2014); 3) High quality instructional coaching improves teacher practice (Knight, 2007); 4) Teachers must engage in inquiry-based professional learning opportunities (Markham, 2012; Smith et al., 2007); 5) Teachers should develop pedagogical content knowledge within collaborative communities of practice (Borko, 2004; Bausmith & Berry, 2011; Franke, Carpenter, Fennema, Ansell, & Behrend, 1998; Gallucci, 2008); and there are increasing calls in the research literature for integrating curriculum, especially in math and science (Committee on Integrated STEM Education, 2014.)