WHY **STEM?** WHY **NOW?** A THREE PART SERIES

PART I – EDUCATION

STEM – it's the hot topic in the education world and for good reason.

The acronym that has educators, businesses and politicians abuzz, STEM is considered the cornerstone of our nation's prosperity.

Why STEM?

The importance of (and dependence on, for that matter) technology is at an unprecedented level and continuing to grow. Technology and scientific innovation are the driving forces of our society, with great impacts on the economy and our standard of living.

America's standing in the global marketplace has depended upon being able to compete with other nations in scientific and technological development, and success requires an educated youth base and a talented workforce.

Why NOW?

To stay competitive, the United States needs the best and brightest minds to advance technologies and solve large-scale problems. However, gaps in education and the U.S. workforce are becoming issues of national concern.

THE STEM CRISIS IN SCHOOLS

While the future of our economy is riding on the shoulders of the next generation, research shows that today's students are not meeting the performance level of their international peers.

Studies find that America's youth are starting to lose interest in math and science as early as third grade. The interest level for these subjects continues to decrease throughout middle school and on to high school, severely impacting the likelihood of students taking upper-levelcourses in math and science. As a result, our economy's competitive edge has severely eroded over the past decade as graduates steered away from occupations in math and science.

The data on STEM education is alarming:

- Students in the United States placed 25th in math and 17th in science in a ranking of 31countries by the Organization for Economic Cooperation and Development.
- In national testing, Florida ranks 42nd in math and 49th in science.
- Only 20 percent of the degrees awarded in Central Florida are based in STEM fields, compared to 30 percent nationally.

The need for engagement in STEM is most acute in populations not traditionally represented in the STEM fields. Even though 43 percent of K-12 children are of African American, Latino or Native American descent, only 15 percent of all of the engineering bachelor's degrees in the U.S. are awarded to minority students. The President's Council of Advisors on Science and Technology recently took a stance, saying, "We must prepare all students, including girls and minorities who are underrepresented in these fields, to be proficient in STEM subjects. And we must inspire all students to learn STEM and, in the process, motivate many of them to pursue STEM careers."

STEM SOLUTIONS

The Orlando Science Center's mission is to *inspire science learning for life*.

Through a diverse and dynamic array of field trips and offsite workshops, the Science Center reaches more than 86,000 youth through school programs annually. We promote critical thinking skills, team work and inquiry-based learning designed to complement formal education. Our programs support teachers and local school districts by reinforcing Florida's Next Generation Sunshine State Standards in math and science and helping educators prepare students for the Florida Comprehensive Assessment Test (FCAT). Additionally, the Science Center holds numerous science competitions, speaker panels and special events to stimulate student interest in STEM. Scholarships are offered through the Science Center's Accessibility Fund to ensure all children, regardless of their family's financial situation, are able to experience hands-on science education.

As your student heads back to school this fall, the Science Center will be offering new STEM field trips that feature in-depth design challenges based on fundamental engineering principles. Students will engage in various challenges both in our labs and out on the exhibit floor, working together to solve problems and design structures.

During a recent Orange County district-wide principal meeting held at the Science Center, school leaders widely praised the new field trip program through their own participation in the experience.

"Developing inquiry through problem-based learning in all content areas provides a platform for learning that is both rigorous and relevant," said Mariel Milano, STEM Coordinator of Orange County Public Schools. "By embedding STEM… we can ensure equity of exposure to these vital classroom experiences for all students. In support of the district STEM initiative, a comprehensive framework has been developed with input stemming from our partnership with the Science Center and industry partners."

The Science Center has also made great strides to engage young children through our very own preschool. Three-to-five-year-olds come to school five days a week and have access to our four levels of exhibits and programming. This environment identifies and meets individual learning styles while stimulating progression at a child's own pace. Math and science are an enhanced focus among the other subject areas, proving it is never too early to spark a curiosity and interest in STEM. In 2013, the preschool will expand to four classrooms, serving 67 students.

Locally, schools are making strides in STEM education by offering intensive magnet programs and career academies focused on specific topics. These schools offer specialized curriculum, classes and internships to prepare students for STEM careers. Check out the following schools for more information:

- Orlando Science School – Kindergarten – 11th Grade Charter School
- Crooms Academy of Information Technology
- Wekiva High School – Laser Photonics Academy
- Lake Nona High School – Health and Digital Media Academies
- University High School – Global Technologies Magnet
- Gateway High School – Academy of Architecture and Engineering Design

Milano said, "The framework will ensure that all OCPS students have experiences with problem-based learning that reinforces that collaborative nature of the 21st century workplace in elementary, middle and early high school. For those students who demonstrate exceptional abilities in the areas of science, technology, engineering and math, rigorous experiences will be available to extend learning."

ORLANDO SCIENCE CENTER