OC STEM Initiative

Vision

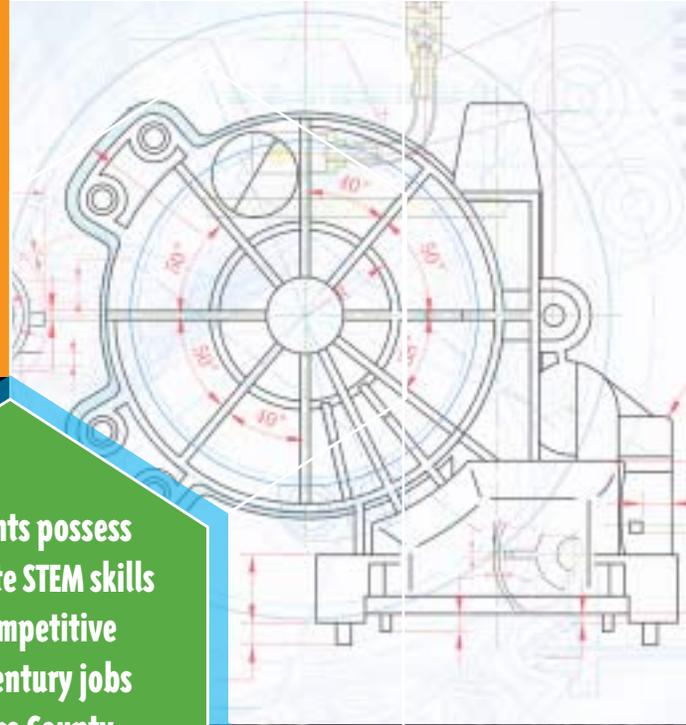**OC STEM**

All students possess the requisite STEM skills to be competitive for 21st century jobs in Orange County

All educators and teachers are provided the tools and support to ensure their students are STEM competent and STEM literate

Orange County is a leader in STEM workforce competitiveness in California and the United States

Objectives

- Foster Orange County's economic competitiveness and sustainability
- Create effective partnerships between community stakeholders, including but not limited to families, education, businesses, government, and philanthropic, organizations
- Promote STEM competencies across the educational continuum in Orange County from PreK through college
- Prepare our children and future workforce to meet the dynamic requirements of a rapidly changing world
- Produce college- and career-ready graduates who possess critical thinking skills and creativity that enable them to make productive choices in work and life

What Sets Orange County Apart?

Orange County possesses unique attributes to establish itself from an advantageous STEM position.

- **Orange County** believes that the development of a STEM competent workforce and citizenry *begin with preschoolers* and continues at every step of the education continuum thereafter.

- **Orange County** is a proven global leader of innovation with a competitive edge, housing a large number of pioneering high-tech and biomedical industries plus new industries such as advanced transportation, alternative fuels, medical devices and computer gaming.

- **Orange County's** possesses a diverse population, with multiple ethnicities and a significant foreign-born population.

- **Orange County** offers a uniquely high concentration of research centers and institutes of higher education with STEM education and workforce efforts.

Situation Analysis

STEM permeates Orange County life – from its miles of coastline and many cities, to its Fortune 500 and 1000 companies, to its K-12 public school districts, community colleges and public and private universities. In fact, Orange County has fared better in the Great Recession compared to surrounding counties and the state because of many STEM-related factors such as the county's role as a leader of innovation, its large number of high-tech industries and global corporations, its leadership in emerging industries, and its high concentration of research and higher education institutes, business incubators and venture capital investments.

> The United States is undergoing a critical economic transformation, moving rapidly from a low-skill, low wage economy to a high-skill, knowledge-based economy driven by technology and innovation.

Yet, in order to maintain Orange County's innovation and competitive edge in the changing global economy, Orange County jobs will require a higher number of STEM proficient students than is currently being prepared.[i] At the national level, business leaders are warning that once the recession ends, they could face shortages in areas ranging from construction and energy to information technology, health care and the STEM fields.[ii] Even local STEM businesses have taken notice. One CEO from a Fortune 500 company with headquarters in Orange County has stated *"If we can help keep students excited about mastering science, mathematics and engineering, we are helping to insure that our company and other great companies will benefit from the good works of these future scientists, engineers and innovators."*[iii]

The Georgetown University Center on Education and the Workforce has found that **"the education system is not producing enough STEM-capable students to keep up with the demand both in traditional STEM occupations and other sectors across the economy that demand similar competencies."** Moreover, the demand for STEM competencies outside STEM occupations is growing.

These economic demands at the national, state and county levels will require an adaptable workforce – one with STEM competencies with a foundation of 21st Century skills required for citizenship, career development and lifelong learning.

Source: Georgetown University Center on Education and the Workforce, 2011
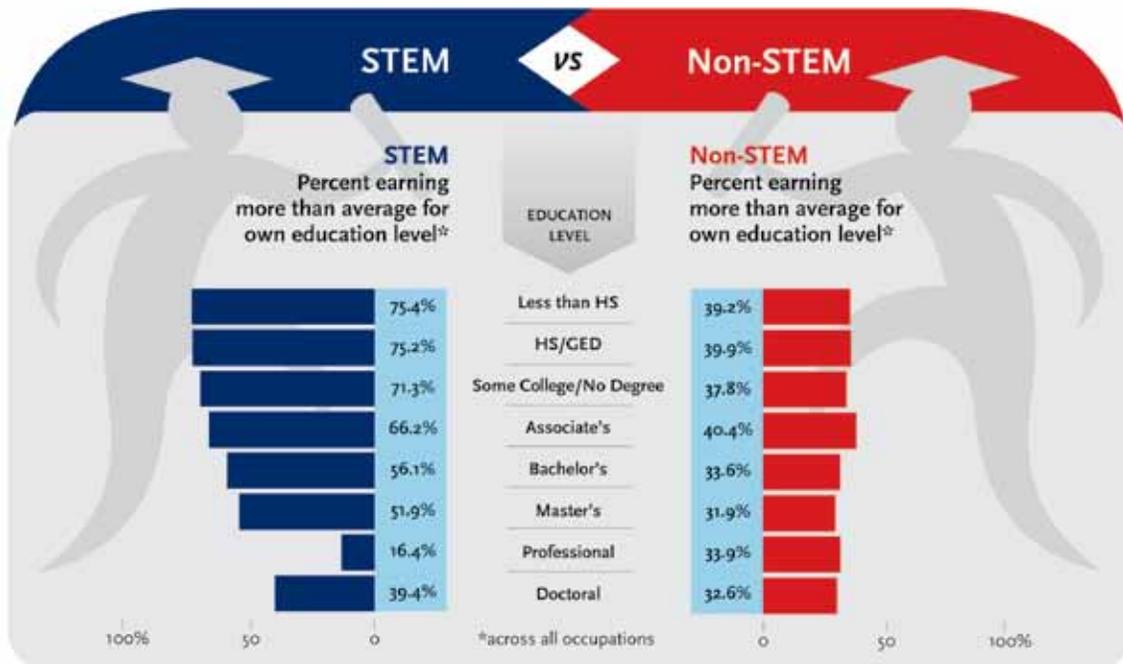
The demand is not restricted to the fields of science, technology, engineering and math. Rather, workers with "STEM competencies" are needed across a broad range of occupations. STEM competencies include knowledge, skills and abilities such as active listening, critical thinking, problem solving and the ability to work collaboratively.

The United States is not producing enough STEM workers to compete successfully in the global economy, despite the fact that STEM workers are in demand and paid comparatively higher wages.

Nationally, STEM occupations are projected to grow more quickly than the economy as a whole (17% versus 10% through 2018) and will be the second-fastest growing occupational cluster, after Healthcare occupations.[iv] In total, Orange County is expected to add approximately 135,500 jobs from 2008-18.

Overall STEM occupations pay well at all educational levels. **People in STEM occupations with a high school diploma or less have higher lifetime earnings than people in other occupations with similar education levels (approximately $500,000 more).** Similarly, STEM majors make substantially more over their lifetime than non-STEM majors.[v]

	STEM Percent earning more than average for own education level*	EDUCATION LEVEL	Non-STEM Percent earning more than average for own education level*
Less than HS	75.4%		39.2%
HS/GED	75.2%		39.9%
Some College/No Degree	71.3%		37.8%
Associate's	66.2%		40.4%
Bachelor's	56.1%		33.6%
Master's	51.9%		31.9%
Professional	16.4%		33.9%
Doctoral	39.4%		32.6%

*across all occupations

Source: Georgetown University Center on Education and the Workforce

Creating a Continous Pathway for STEM Teaching and Learning in Orange County – The Need for a Continuum Approach

Early Learning						Elementary School					Middle School		High School				Higher Education				
Birth	1 yr	2 yr	3 yr	4 yr	K	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	Career

Academic Milestones: Critical Transitions and Benchmarks

Acquires English language and building vocabulary (oral)
Develops motor and perceptual skills
Stimulates brain and behavior

Good basic reading skills

Students either are or are not comfortable with math & science

Students start losing ground in math

Proficiency in Algebra I

Students start to question relevancy of school learning to their lives

Takes SAT and ACT
Graduates from high school
Passes high school exit program
Completes college prepatory coursework (A-G requirements)

College Math/English preparatory attainment to transfer from community college to university

Graduates from college

Enters workforce

Student, Family and School Support

Parental knowledge of early development increases

Receives guidance from a non-parent mentor

Has strong parent-child communication
Builds self-awareness and self-regulation

Practices healthy behavior
Develops empathy and cooperation

Has qualified math and science teacher

Attains social and emotional competence

Participates in community and social organizations

Adopts about a career plan

Has sufficient financial aide
Develops time and stress management skills
Engages in community and campus organizations

© Samueli Foundation, 2011

To develop STEM competent students and meet the demand of the 21st century economy, it will be critical to develop a framework that address the continuum of STEM teaching and learning from early childhood through higher education to employment in STEM related fields in Orange County. This continuum identifies those student, family and school supports and academic milestones for a child as he or she progress through each grade as a framework for STEM education in Orange County and recognizes the various pathways for students to attain STEM competencies.

A continuum that encompasses all aspects of student development, including family and school support, is needed to develop STEM competent students and ensure a growing STEM competent workforce.

Early Learning – Early Opportunities that Build the Foundation of STEM Competencies

Currently, California does not have a common standardized measure or any statewide data regarding school readiness in kindergarten. However, compelling evidence suggests that the achievement gaps that exist between student groups in 2nd grade are foreshadowed at kindergarten entry.[vi]

Research also suggests that very young children are ready to learn a broad array of mathematics content that will give them a solid base for future learning.[vii] Six longitudinal studies showed that early math skills are the most powerful predictor of later school success.[viii]

The development of STEM skills, such as critical thinking, is being formalized into preschool curriculums and within the early childhood development community, there is a greater emphasis on training teachers to teach STEM activities. According to one leading early childhood development expert, "Children are strong and natural explorers and even have some surprisingly abstract abilities for grasping basic scientific principles."[ix] In a survey conducted in 2010, Californians reported seeing early science as foundational to success in high school.[x]

Elementary, Middle and High School – Reinforcement and Practice of STEM Competencies

According to the 2006 Programme for International Student Assessment (PISA), U.S. students performed much worse in science and math than students from other industrialized countries. Of the 30 countries tested, students from 16 countries performed higher than U.S. students in science, and students from 23 countries performed higher than the United States in math.[xi]

In comparison, Orange County students outperform their statewide peers in mathematics and science, however disparities among districts remain. In 2010, 68% of 2nd grade students and 57% of 7th grade students in Orange County scored proficient or above on the Mathematics California Standards Tests (CST) compared to 62% and 49%, respectively, statewide. Orange County 5th, 8th and 10th grade students had a higher percentage of proficient and above performance on each of the Science CSTs than their peers statewide. Although Orange County students appear to outscore their statewide counterparts in Mathematics and Science CSTs, the results are inadequate.

It is imperative to understand the intersections between the development of STEM competencies and the support children need from their family and school environments to meet the academic milestones identified in the continuum graphic.

Notwithstanding that Californians believe that science education is important and should be a priority for their, 40% of elementary teachers say they spend 60 minutes or less teaching science each week and nearly one-quarter of middle school teachers may not have an adequate background or preparation for teaching the subject.[xii] Something needs to change.

Research from the 2011 report "High Hopes – Few Opportunities: The Status of Elementary Science Education in California" indicate that at the elementary school level, teachers are under pressure to meet the accountability goals in mathematics and English, which limits time for science education.[xiii] In addition, elementary teachers and schools do not have the infrastructure to support quality science learning.

Although middle schools offer dedicated time for science, access to facilities and teachers who have been prepared for science instruction, often times students arrive to middle school unprepared and uninterested in science.[xiv]

Elementary School Science Education Findings
- Only one-third of elementary teachers say they feel prepared to teach science.
- 85 percent of teachers say they have not received any professional development in science during the last three years.
- Nine in ten principals say science education is very important and should start early.
- Less than half of principals (44%) believe it is likely that a student would receive high-quality science instruction in his or her school.

Source: The Center for the Future of Teaching and Learning at WestEd

Middle School Science Education Findings
- Nearly half (47%) of principals report students' lack of preparation as a major or moderate challenge.
- Nearly one-quarter of middle school teachers may not have an adequate background or preparation for teaching the subject.
- Nearly 60 percent of surveyed teachers identified insufficient professional development as a barrier to high-quality science instruction.
- Just 14 percent of middle school teachers provide a pattern of classroom practices that support regular engagement of students in the practices of science.

Source: The Center for the Future of Teaching and Learning at WestEd

Yet by high school, only 20% of Orange County students enroll in upper level math courses; while 14% of students enroll in Chemistry and 6% in Physics. There is ethnic disparity in both enrollment and performance. For example, Hispanic students comprise approximately 40% of the K-12 population, with a disproportionate rate of under-enrollment and under-performance in upper level math and science coursework.[xv]

In 2009-10, approximately 36.2% of Orange County high school students were eligible for entry into the UC/CWU university systems, higher than the California rate of 35.6%.[xvi]   Asian students had the highest level of eligibility at 63% followed by Filipino students at 49.9% and White students at 40.8%. Latino students had the lowest rates of eligibility at 19.8%.

Higher Education

The "Biotechnology Career Ladder" graphic illustrates the importance of an education pathway from K-12 through higher education to workforce development.[xvii] For this example, a person inter-ested in the Biotech industry could meet job requirements through job training after high school. As the person advances, more knowledge and skills are warranted.
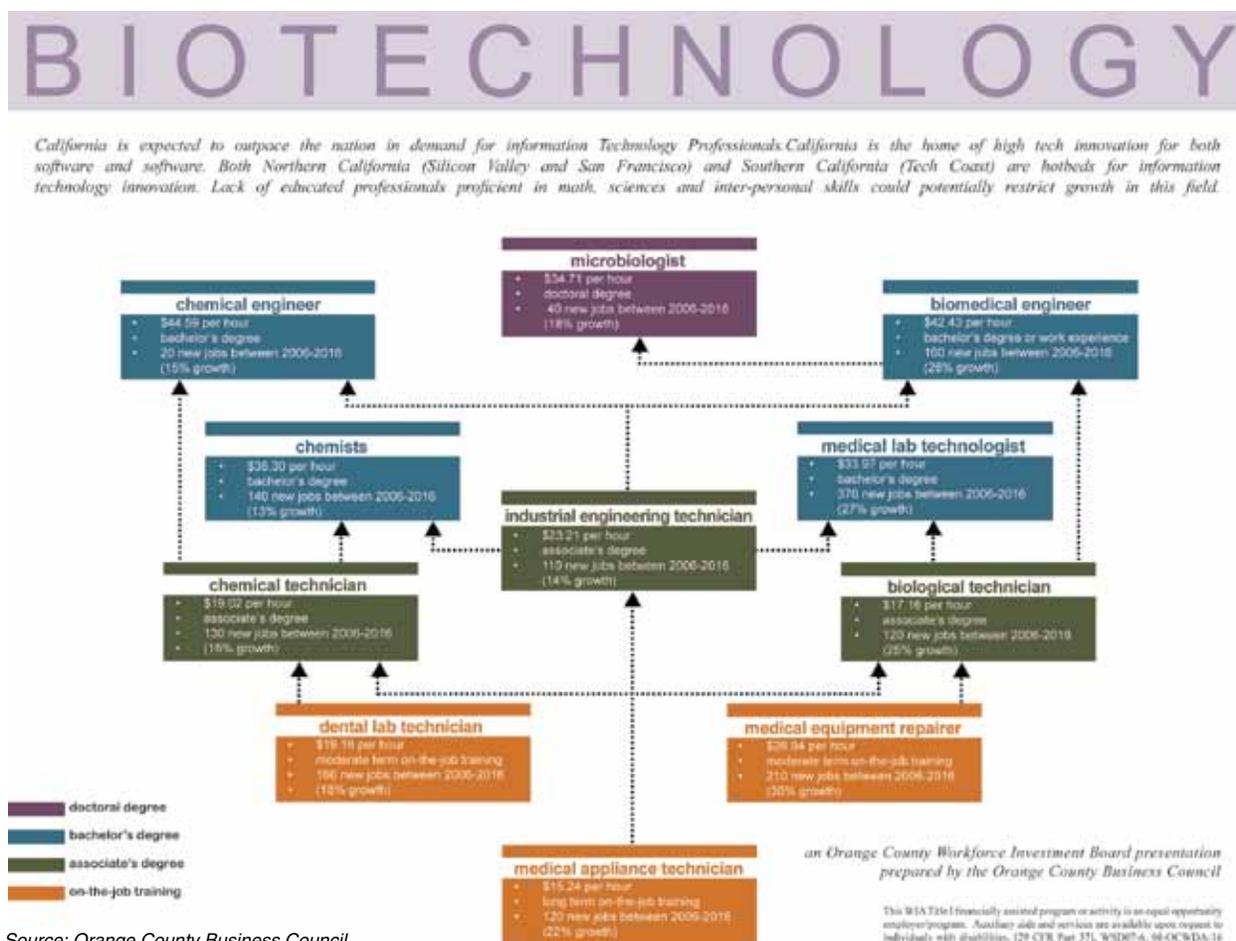
Source: Orange County Business Council

But, how is this accomplished with only 40% of 27 year olds nationally having earned an associate degree or higher?[xviii] Experts project that there will still be job openings for people with just a high school degree but the jobs will make up a small percentage of total job openings. In fact, over the past century, all of the net job growth in the United States has been generated by positions that

require at least some post-secondary education (community colleges, a four-year school, career technical education, or an apprenticeship).

In Orange County, 33.6% of students enrolled in Career Technical Education programs represented STEM related disciplines in 2010. Of the STEM disciplines, the three programs with the highest number of student enrollment were: Electrical, Electronics and Communications Engineering; Civil Engineering; and Mechanical Engineering. The California Community Colleges' Career Technical Education provides education for technical skill demands of emerging industries, as well as basic work readiness skills that California's employers need.[xix]

In 2010, only 4.8% of total associate degrees granted by Orange County Community colleges and WASC accredited non-public institutions were STEM related.[xx] Of those STEM related associate degrees, Mathematics, Chemistry and Biology accounted for 55.5% of all the STEM disciplines awarded.

In 2010, roughly 17% of total undergraduate and 22% of graduate degrees granted by Orange County universities were tech related.[xxi]
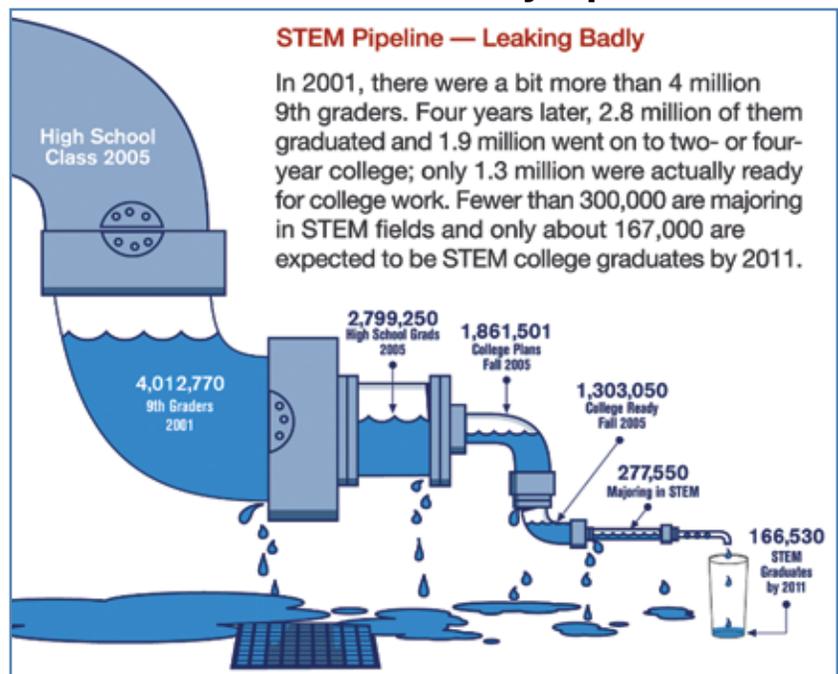
STEM Degrees Granted by Orange County Universities, 2009[xxii]

Discipline	2009		2003-2009 % Changes	
	Bachelors Degrees Granted	Graduates Degrees Granted	Bachelors Degree Change	Graduates Degree Change
Biological Sciences	894	70	70.6%	66.7%
Biology	140	11	14.8%	-38.9%
Engineering	530	348	47.6%	96.6%
Information and Computer Sciences	178	70	-46.2%	0%
Computer Sciences	70	126	-43.5%	207.3%
Physical Sciences	388	161	114.3%	159.7%
Other Sciences	8	54	-74.2%	42.1%
Total	2,208	840	32.1%	87.5%

Source: 2011-12 Orange County Workforce Indicators Report

The Problem: A Leaky Pipeline

The STEM pipeline carries students from high school through university and on to jobs in STEM. However, in Orange County and across the nation, the pipeline leaks students at multiple stages. This leakage is critical to understanding the need for a comprehensive education continuum approach for students to attain STEM competencies.

STEM Pipeline — Leaking Badly

In 2001, there were a bit more than 4 million 9th graders. Four years later, 2.8 million of them graduated and 1.9 million went on to two- or four-year college; only 1.3 million were actually ready for college work. Fewer than 300,000 are majoring in STEM fields and only about 167,000 are expected to be STEM college graduates by 2011.

High School Class 2005

4,012,770 9th Graders 2001

2,799,250 High School Grads 2005

1,861,501 College Plans Fall 2005

1,303,050 College Ready Fall 2005

277,550 Majoring in STEM

166,530 STEM Graduates by 2011

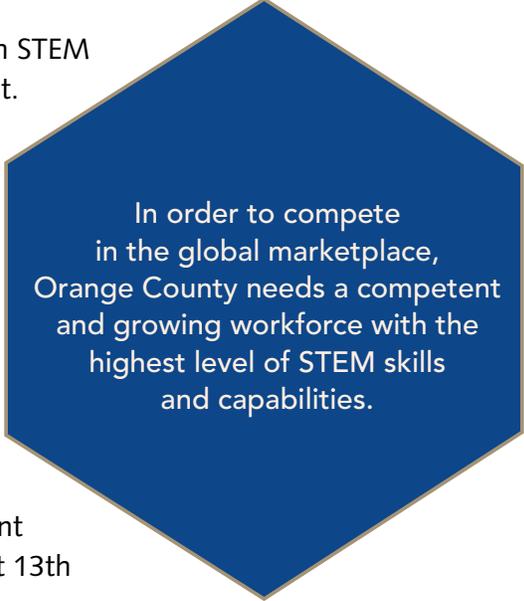*Courtesy of the Bill and Melinda Gates Foundation*

The number of STEM jobs in the United States is projected to grow by 17 percent between 2008 and 2018, compared with only 10 percent U.S. job growth overall.[xxiii] The number of jobs requiring STEM skills is even greater!

California's economy is also becoming more knowledge-based, with STEM employment increasing at a faster rate than non-STEM employment. Between 1999 and 2007, STEM employment increased by 25% while non-STEM employment increased by only 16%.[xxiv] And even those traditional non-STEM jobs, such as those in the medical profession or business sector, will require a high level of critical thinking, and collaborative and innovative skills that can only be derived from a solid STEM-based education.

However, data suggests that the state's supply of graduates in these fields is shrinking. While California ranked 4th on the 2010 State Technology and Science Index – performing well in risk capital, entrepreneurial infrastructure, and research and development inputs – the state's lowest ranking was in human capital capacity, at 13th out of 50.[xxv]

> In order to compete in the global marketplace, Orange County needs a competent and growing workforce with the highest level of STEM skills and capabilities.

In Orange County, professions in eight of the 10 industry clusters as identified by the Orange County Workforce Investment Board require STEM competencies and skills.[xxvi] These industry clusters include: Management & Administration; Energy, Environment & Green Technologies; Construction; Finance, Insurance & Real Estate; Healthcare; Information Technology; Manufacturing; and Biotechnology & Nanotechnology. According to the 2011-12 Orange County Workforce Indicators Report, as many as 85 percent of all new jobs in Orange County from 2010-2020 will be in following six economic sectors: Healthcare, Business Services, Leisure and Hospitality, Construction, Manufacturing and Retailing.[xxvii]

The Orange County Business Council has identified International Trade, Information Technology, Creativity and Cleantech as emerging cluster drivers among the traditional clusters in 2010. These are clusters that created high-paying jobs and initiated economic growth throughout the County.[xxviii] **Each of these clusters will require a STEM competent workforce to continue to meet the growing demand.**
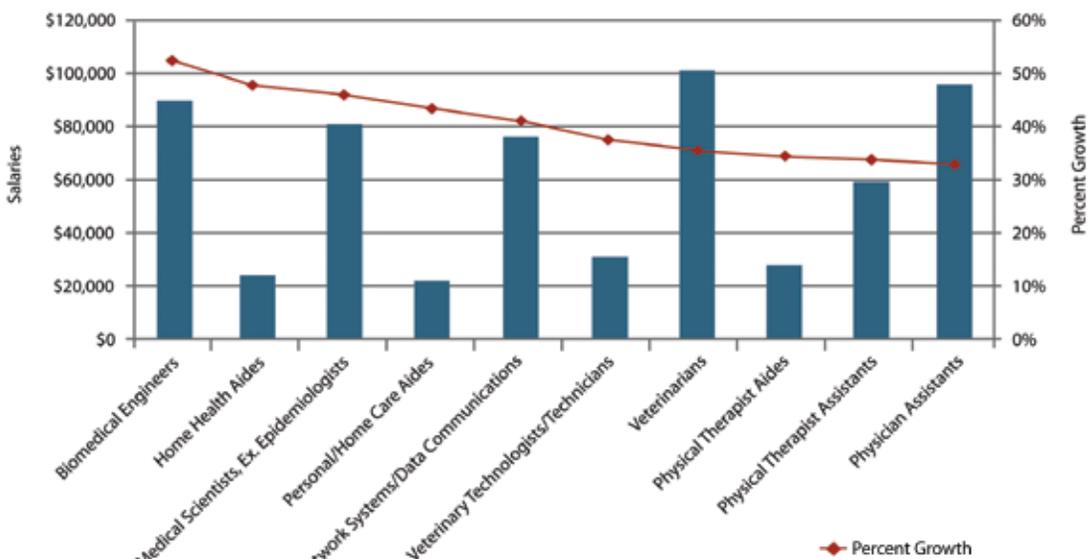
Orange County Cluster Drivers, 2010
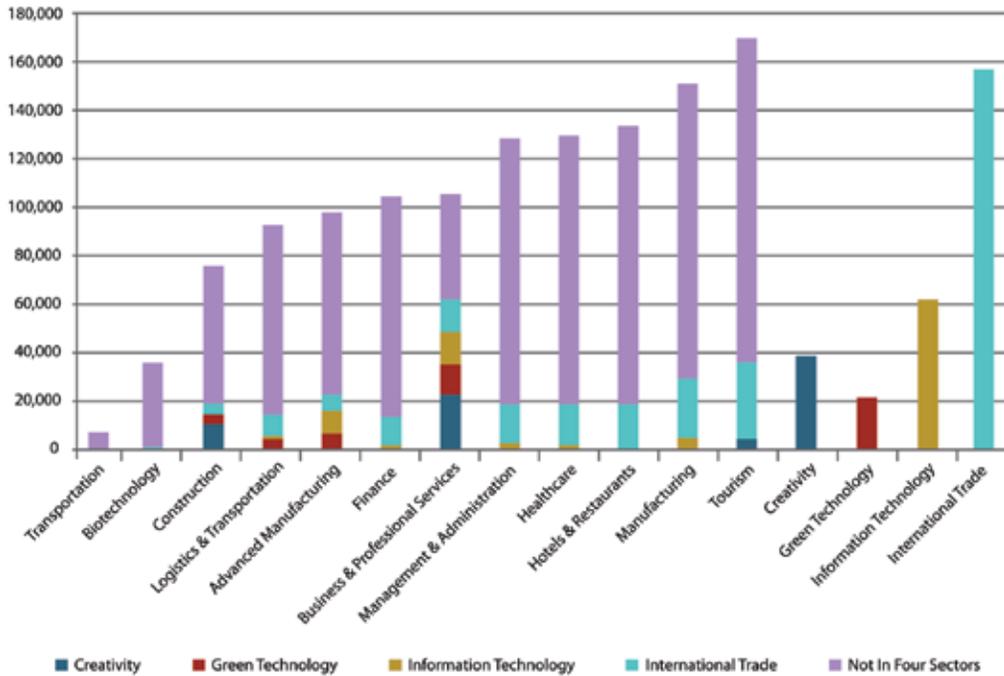
Source: 2011-12 Orange County Workforce Indicators Report

According to the 2011-12 Orange County Workforce Indicators Report, five of the 10 high growth occupations have salaries above $70,000. These occupations represent the High-Tech, Management and Administration, and Healthcare clusters.[xxix] All of which require a level of STEM proficiency and skill.

Average Salaries of Fastest 2008 to 2018 Growing Occupations in Orange County

Source: 2011-12 Orange County Workforce Indicators Report

Despite the potential lucrative nature of STEM careers and the increasing rate of STEM jobs, during this decade, the United States will produce twice as many graduates in social sciences and business as in STEM degrees. Orange County is no different. The rate of increase is outpaced by the rate of Orange County employers' need for even greater numbers of STEM workforce.[xxx]

Blue Print for Success

Organizational Structure

Goal: Build a sustainable structure to support the ongoing implementation of successful STEM programs

Activity	Deliverables	Short Term Benchmarks (1 - 3 years)	Long Term Benchmarks (4-6 years)
Develop a funders' network Develop a funding strategy Adopt an action plan and logic model Develop staff and operational support Create a process for organizational evaluation	Funders network structure including bylaws, meeting protocol, governance, budget, and membership roster Case statement Annual fund development plan Blueprint for OC STEM success Online, dynamic Blueprint for OC STEM success Branding session/outcomes to develop OC STEM branding moving from "initiative" to established program Executive Director and administrative and operations staff members in place Office space and equipment secured Annual evaluation or audit report prepared by outside firm assessing the organization, including staff positions, expertise needed, etc.	Increased number of funding partners supporting STEM in Orange County Established Governing Directors for OC STEM network and criteria Increased dollars dedicated to STEM operations and programs through philanthropy and government grants Increased number of funding partners adopt/approve Blueprint for OC STEM success Regular updates on OC STEM programs/progress on website OC STEM becomes an established, branded program Executive Director and at least one staff members hired Temporary office space for OC STEM program operations identified Funders review and implement recommendations from organizational evaluation annually Organizational Success Indicators identified, tracked and show improvement	Increased number of funding partners providing sustainable capacity and support for the STEM Initiative in Orange County OC STEM network considers becoming its own 501(c) 3 Regular updates on OC STEM program progress on website OC STEM becomes countywide, recognized program for STEM success Expanded staff if needed Permanent office space and operating equipment secured Funders review and implement recommendations from organizational evaluation annually Organizational Success Indicators identified, tracked and show improvement
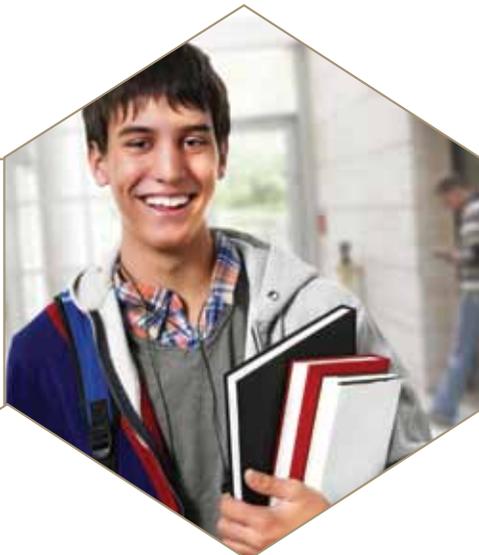
Blue Print for Success

STEM Communications Strategy

Goal: Promote awareness of STEM competencies and why they are important

Activity	Deliverables	Short Term Benchmarks (1 - 3 years)	Long Term Benchmarks (4-6 years)
Design and implement awareness campaign(s) for various audiences Gather business, educators, government, funders, community organizations on a regular basis to share STEM-related information, resources, and results	Strategic Awareness Campaign/communications materials targeting all audiences including hard to reach populations Quarterly STEM-related lecture series for network members Annual STEM gathering for STEM programs across the educational continuum and workforce development OC STEM Website	Public awareness consultant hired to design and implement STEM-focused public awareness campaign(s) Increased number of awareness campaigns conducted Increased traffic/data analytics for the newsletter Increased number and breadth of participants at quarterly and annual gatherings. Increased awareness about STEM throughout various sectors (private, public, education) in Orange County Increased traffic/data analytics for the website, create intranet for lead STEM practitioners	Increased awareness about STEM throughout various sectors (private, public, education) in Orange County Question about STEM awareness added to a countywide survey

STEM Learning

Goal: Create interest among students, preschool through college, to pursue the development of their STEM knowledge, skills and abilities
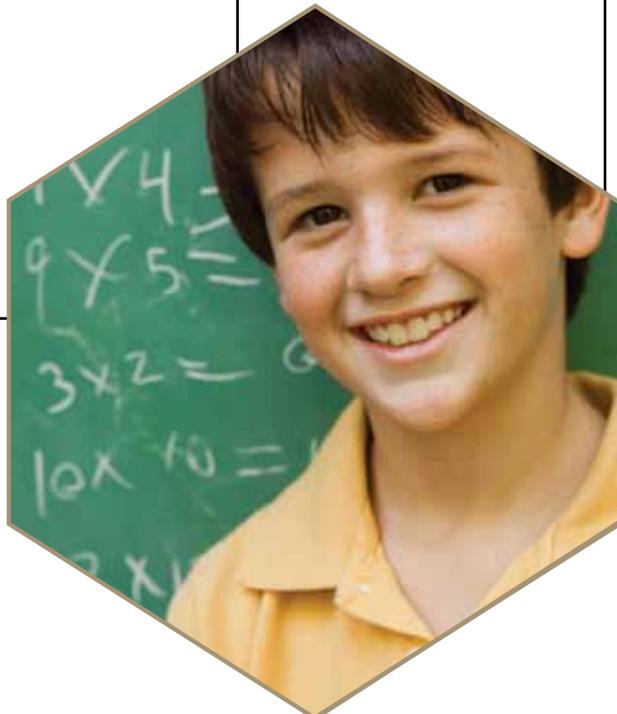
Activity	Deliverables	Short Term Benchmarks (1 - 3 years)	Long Term Benchmarks (4-6 years)
Introduce and implement STEM curricula in preschool classrooms. Increase the opportunity for K-12 students to experience project-based, hands-on STEM learning, for in-school and out-of-school environments Expand a career and college ready pathway with STEM disciplines taught linking high schools and community colleges with higher education Expand the number of students who pursue advanced certifications and degrees in STEM fields	A continuum of STEM programs targeted to preschool through college-aged students that align with common core and next generation science standards, and meet established best practice standards.* *Each program will have its own detailed summary sheet of the program and related activities/deliverables.	Increased number of STEM programs, preschool through college Increased number of out-of-school (OST) STEM programs Increased number of informal learning opportunities for families and communities Increased number of STEM professionals and volunteers in preK-12 classrooms Increased number of students taking AP classes in STEM subject areas Increase in student achievement in STEM subject areas Increased number of ROP certificates related to STEM awarded to high school students in Orange County Increased number of STEM career pathways from high school and community colleges to four-year institutions	Increased number of quality/effective STEM programs in Orange County Every student PreK-12 experiences project-based, inquiry-based learning Increased number of schools providing fully integrated STEM approach bridging out-of-school and in-school platforms Increased student achievement in STEM subject areas Increased number of students taking AP classes in STEM subject areas Increased number of ROP certificates sought after by students Increased number of STEM programs offering pathways to community college and higher education Decreased number of students requiring remedial math for college entry Increased number of college graduates with STEM majors

Professional Development

Goal: Promote educators' STEM knowledge, competencies, and pedagogy

Activity	Deliverables	Short Term Benchmarks (1 - 3 years)	Long Term Benchmarks (4-6 years)
Develop STEM-related professional development strategies targeted to educators at all levels of the educational continuum for both formal and informal learning environments: • PreK • K – 6 • Middle School • High School • College Promote integration of STEM-related disciplines and competencies into the curriculum of educational institutions with education credentialing or early care disciplines	A robust online professional development platform on STEM for all educators and teachers in STEM disciplines A Lead STEM Practitioner program established at Orange County school districts A STEM internship and mentoring program between businesses, community colleges, and four-year institutions A workshop for leaders at Orange County universities, colleges and community colleges that have a credentialing or early education career program to begin the discussion of the importance of STEM education and competencies	Increased number of STEM-related professional development opportunities Increased number of educators attending professional development opportunities Increased number of educators utilizing the online professional development platform Increased number of internship and mentoring programs between business, community colleges, and four-year institutions Increased number of mentors/mentees participating in internship and mentoring programs per year Increased number of preschool through college educators with STEM teaching competency	Change in PreK through college educator attitudes about the necessity for teaching and learning STEM competencies Increased number of preschool through college educators with STEM teaching competency Change in educator, administrator, and after-school staff attitudes towards an integrated approach to STEM teaching and learning between out-of-school and in-school platforms STEM disciplines and competencies become standardized into the curriculum for educators and early care providers A continuing education (CE) professional development program with incentives Every Orange County teacher has participated in a STEM-related professional development workshop Every student in an educational/early care discipline has taken a STEM-related workshop/course

Blue Print for Success

Workforce Development

Goal: Bridge the gap between a STEM-educated workforce and Orange County businesses' demands

Activity	Deliverables	Short Term Benchmarks (1 - 3 years)	Long Term Benchmarks (4-6 years)
Improve linkage between Orange County's STEM-related industries/businesses and educational institutions	Bring workforce/industry leaders (e.g. Workforce Investment Board, OCBC, OCTANe) together with educational institution leaders on a regular basis to facilitate dialogue about emerging workforce needs, regional occupational shortages, and to reinforce STEM competency needs and proficiency requirements	Orange County Workforce Indicators Report is used to inform dialogue between STEM businesses/ educational institutions Reduced shortage of locally-trained STEM-capable workers	Reduced shortage of locally-trained STEM-capable workers Provide a tangible pathway for locally educated OC students to remain in OC in gainfully employed STEM positions that meet the needs of local STEM employers, while providing a quality standard of living for the employee

Research and Evaluation

Goal: Promote rigorous research-based approaches to STEM teaching and learning

Activity	Deliverables	Short Term Benchmarks (1 - 3 years)	Long Term Benchmarks (4-6 years)
Create a process for research and evaluation related to STEM activities in Orange County	A regularly updated database of STEM programs in Orange County A metrics tool for assessing outcomes and programs	Increased number of quality/effective STEM programs in Orange County	Increased number of quality/effective STEM programs in Orange County Develop a grading or rating type system to assess quality and comparison of STEM program providers

While a comprehensive strategic plan is foundational to the long-term success of any endeavor, there is also great **value in identifying early success projects** that can coalesce supporters, gain momentum for the movement, and move the initiative forward with new partnerships, positive outcomes, and insights gained from practical lessons learned. In this context, the following projects are early action projects for the first year of the OC STEM network.

Learning from the Best of the Best

Quarterly Lecture Series: Quarterly meetings bring together members of the OC STEM Initiative and individuals interested in expanding and promoting STEM education in Orange County on a regular, scheduled basis. The series includes innovative speakers presenting on the newest technology and programs in the areas of Science, Technology, Engineering and Math and provides a platform for discussions among participants.

Building Partnerships, Building STEM

National Lab Network – Orange County: The existing STEM Volunteer and Mentor program was created to expose PreK-12 students and teachers to STEM professionals and project-based, inquiry-based learning. This early action project includes marketing the National Lab Network – Orange County, recruiting STEM businesses and educators to register on the website, assisting in the "matches" between STEM professionals and educators, and designing an evaluation.

STEM Learning and Teaching Resources for PreK-12 Educators: Through a partnership with the Silicon Valley Education Foundation, Gooru and OC STEM Initiative, this project will build upon the infrastructure of the Lessonopoly website and provide a more robust design, search engine power and increased functionality to Orange County educators.

Setting Teachers Up for STEM Success

Lead STEM Practitioners: This effort will launch a program wherein each Orange County school district designates a Lead STEM Practitioner (LSP) through an application process. Each LSP will participate in STEM-related trainings, be equipped with a tablet, and have access to an intranet site through the OC STEM website. The website will house STEM lesson plans, activities, and social networking functionality. LSPs will become the conduit for STEM information flowing from OC STEM to the districts and back, helping to increase awareness of STEM throughout all districts.

STEM for Preschoolers? There's Jr. Higher-created App for That!

App Jam 2.0: In collaboration with the Donald Bren School of Information and Computer Sciences Student Council, this is designed to educate Orange County middle school student in the creation of mobile applications and in doing so, excite them about the opportunities available to them in the STEM fields. The project pairs undergraduate level computer science students with middle school students in the creation of STEM related mobile applications for early learners. The winning apps would be brought to market through the Android or Apple platforms.

ocstem.org: the Go-To Place for STEM in Orange County

ocstem.org is Orange County's comprehensive website for all things STEM – programs, events, partners, articles, news and more. The website acts is the main conduit of STEM information in the county. In the next year, the website will house the Lead STEM Practitioner Program's intranet site, OC STEM Initiative member's intranet site for schedule of meetings and events plus other additional project management information, and a fully functioning National Lab Network database with links to YouTube, Facebook and other social media platforms.

Leveraging Our Dollars and Relationships to Bring STEM to Orange County

An important role for the OC STEM Initiative will be to seek funding and support for STEM programs within Orange County. This includes seeking funding opportunities at the Federal, state and local levels by leveraging relationships and expertise. This includes supporting the Santa Ana Unified School District's grant submission for the Investing in Innovation Fund (i3) through the US Department of Education, which, if awarded, would expand MIND Research Institute's PreK Math Program throughout the Santa Ana Unified School District.

The OC STEM Initiative is a regional alliance of the California STEM Learning Network, whose mission is to build a network of educators, business leaders and other stakeholders committed to establishing the world's best STEM education system in California. As a member of the network, the OC STEM Initiative is able to leverage key relationships with other STEM regions throughout the state. For example, the OC STEM Initiative was able to support 10 Orange County Boys & Girls Clubs participation in the Boston Museum of Science's national pilot study of a four unit curricula that exposes 3rd-5th grade students on the engineering design process through hands-on activities. The pilot began in January 2012, concluding by the end of the school year.

The OC STEM Initiative is also part of the California Afterschool Network's STEM in Out-of School Time program which is working to increase opportunities for high quality STEM learning for youth throughout the state. Because of the involvement of the OC STEM Initiative in the program, Orange County was a pilot site for an afterschool STEM program, which will run 2011-12.

Starting the Drumbeat

The OC STEM Initiatives looks to support STEM focused events and meetings that help support its vision. For example, in February 2012 in partnership with the National Science Resources Center, Science@OC, Orange County Department of Education, , the Synergy for Success in Science Education brought together 15 leadership/district teams, consisting of superintendents, science educators, science curriculum specialists, and local business partners, to begin a dialogue and framework that addresses science education across their districts. In April, in partnership with the California STEM Learning Network and the Heising-Simons Foundation, the Early Math Learning and Teaching convening was hosted at the University of California Irvine's Department of Education. The full day event brought together early math research experts with professionals representing counties throughout southern California to discuss the latest findings and begin to dialogue about next steps at the state and local levels. The OC STEM Initiative will continue to look for opportunities to support such events.

OC STEM Initiative Funding Partners

- Allergan Foundation
- Boeing Company
- Brandman University
- Broadcom Foundation
- Children and Families Commission of Orange County
- Cotsen Foundation
- Edwards Lifesciences
- JP Morgan Chase Bank
- Kay Family Foundation
- Kaiser Permanente
- OCTANe
- Orange County Department of Education
- Orange County United Way
- PBS SoCal
- Samueli Foundation
- Tiger Woods Learning Center/Foundation
- Time Warner Cable
- UC Irvine Henry Samueli School of Engineering

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