

DATE: June 10, 2011

TO: Children and Families Commission of Orange County

FROM: Michael M. Ruane, Executive Director



SUBJECT: Launch of OC STEM Partnership

SUMMARY:

The Children and Families Commission of Orange County's investment in early learning programs has expanded to include early math, which has been cited as a strong predictor of a child's scholastic success. The Commission's investments have included co-sponsorship of the STEM Summit 2010, development of an innovative, computer-based early math program, and the inclusion of early math programs in the school readiness work plans with the elementary school districts. This item presents a summary of the need for STEM education and a recommendation to participate and support the OC STEM Initiative.

Orange County STEM Initiative and Funders Collaborative

The Orange County STEM Funders Collaborative will support Science, Technology, Engineering and Mathematics (STEM) teaching and learning in Orange County. The funders collaborative will be comprised of organizations that are committed to improving STEM education for all Orange County students, ensuring that students are college and career ready in the STEM fields, and developing a skilled and continuous workforce to meet the scientific and technological needs of the employer base of Orange County. This partnership will be modeled after the successful Orange County Health Funders Partnership and similar collaborative efforts. The initial partners are the Samueli and Broadcom Foundations, and other foundations will be invited to support this effort.

OC STEM Initiative Partners

The Samueli Foundation has taken the lead to convene the OC STEM Initiative that includes representatives from the following organizations: the OCTANe Foundation for Innovation, Orange County Department of Education STEM Community Collaborative Project, Discovery Science Center, and Science@OC. The participating organizations represent the full continuum of learning from preschool through higher education, to the work force. The Initiative representatives will meet this summer to develop a joint work plan that will include a strategic communications plan, best practices and pilot programs, and fund development and partnerships.

STEM Summit 2010

The OC STEM Initiative follows-up on the momentum that began with the STEM Summit 2010. The Summit was hosted by the National Academy of Engineering and sponsored by the Samueli Foundation and the Commission to address the growing national effort to raise awareness of the need to prepare children to compete globally. Leading national experts in education and early

childhood development were convened to discuss the importance of incorporating STEM education at the earliest possible point in a child's life. The White House Writers Group has redistributed the research, insight and expertise presented at the Summit in a monthly series of articles through the STEM Lab website.

National, State, and County STEM Education Trends

At the national level, the United States now lags behind other nations in STEM education. Additionally, there is an achievement gap among some ethnic groups in STEM. These ethnic groups and women are significantly underrepresented in many STEM fields. Research suggests that at the national level, the issue is not simply the lack of proficiency among students in the United States, but that it is also a lack of interest in STEM fields among many students.

California is projecting a growth in STEM careers; however data suggests that the supply of graduates in these fields is shrinking. In order to compete in the global marketplace, California's STEM workforce will need to be competent and creative. In 2010, Orange County's students in the second-tenth grades outperformed their statewide peers on the California Standards Test in mathematics and science, however approximately 18 percent of undergraduate degrees granted by Orange County universities in 2009 were tech related. Orange County students will need to be college and career ready in STEM fields to compete in the global marketplace.

Early Math/STEM Education

The National Council for Teachers of Mathematics has urged high-quality math instruction for 3- to 6-year olds. UC Irvine Professor of Education, Greg Duncan, has quoted in a recent article (Attachment 3) that early math skills are the most consistently predictive of academic success. The Commission has responded by investing in early math programs such as the MIND Research Institute, and through the School Readiness programs at the elementary school districts. The Commission's participation in the OC STEM Initiative will ensure the inclusion of early math education opportunities for preschool aged children, and a forum to present the early math tools developed by the MIND Research Institute.

Proposed Three-Year Work Plan

Catalytic funding of \$250,000 for the OC STEM Initiative is recommended to support the first three-years of the Initiative. The three-year work plan (Attachment 1) will include program management, strategic communications, assessment of best practices of innovative programs, fund development, and annual reviews of the program. OneOC is the designated fiscal agent for the OC STEM Initiative and will also manage any outside grants received.

STRATEGIC PLAN & FISCAL SUMMARY:

This program has been specifically reviewed in relation to the Strategic Plan, and is consistent with the Early Learning goal area. This funding request is for \$250,000 for the term July 1, 2011 through June 30, 2014. Funding for this item is included in the FY 2011-12 Budget within the Strategic Communications and Strong Families budget categories and will be included in these budget categories in future fiscal years.

PRIOR COMMISSION ACTIONS:

- July 2009 – Approved STEM Disciplines 2009-10 Work Plan, amendment to MIND Research Institute, and agreement with the White House Writers Group.

RECOMMENDED ACTION:

Adopt Commission Resolution (Attachment 4) authorizing the Executive Director, or designee, to prepare and negotiate Agreement C-286 with the Volunteer Center of Greater Orange County, dba OneOC, to provide, services related to the Orange County STEM (Science, Technology, Engineering and Mathematics) Initiative for the three-year period from July 1, 2011 through June 30, 2014 in an amount not to exceed \$250,000.

ATTACHMENTS

1. OC STEM Initiative Three-Year Work Program
2. Samueli Foundation Letter: OC STEM Initiative Funding Proposal
3. UCI Article: Early Math Skills Predict Later Academic Success
4. Resolution for new Agreement C-286 with the Volunteer Center of Greater Orange County, dba OneOC for the OC STEM Initiative.

Contact: Kelly Pijl

**OC STEM INITIATIVE
THREE-YEAR WORK PROGRAM**

Initial Mission Statement: *To support Science, Technology, Engineering and Mathematics (STEM) teaching and learning in Orange County, and collaborate with other regional, state and national STEM networks to leverage resources and successes.*

COMPONENT	YEAR ONE	YEARS TWO & THREE
Program Management	<ul style="list-style-type: none"> • OneOC to serve as fiscal sponsor for Initiative • Samueli Foundation to provide in-kind program management 	<ul style="list-style-type: none"> • Develop more formal structure similar to OC Health Funders Partnership
Strategic Communications	<ul style="list-style-type: none"> • Maintain momentum from 2010 STEM Summit • Utilize White House Writers Group for initial work 	<ul style="list-style-type: none"> • Initiative will determine approach for future strategic communications efforts
Best Practices/Innovative Programs	<ul style="list-style-type: none"> • Inventory of effective national and state STEM programs • Showcase Orange County programs for potential expansion 	<ul style="list-style-type: none"> • Assessment of scalability of effective, specific programs • Showcase successful programs and lessons learned
Develop/Expand Funders Collaborative	<ul style="list-style-type: none"> • Establish initial funders group • Expand to include additional funding partners and foundations 	<ul style="list-style-type: none"> • Formalize networks as separate entity or regional network of state or national STEM collaborative
OC STEM Strategic Plan	<ul style="list-style-type: none"> • Develop Strategic Plan for OC STEM, including operational metrics • Funding for years two and three contingent on completion and submittal of Strategic Plan 	<ul style="list-style-type: none"> • Implement approved Strategic Plan
Annual Review	<ul style="list-style-type: none"> • Annual review submitted to Commission prior to proceeding on Year Two and Three 	<ul style="list-style-type: none"> • Year Two and Three performance review submitted to Commission



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May 24, 2011

Orange County Children and Families Commission
17320 Red Hill Ave # 200
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RE: OC STEM Initiative Funding Proposal

Dear Chairman and Members of the Commission:

Thank you for your consideration of the recommendation to support the development of Orange County's STEM Education Initiative project. Since our sponsorship of the *STEM Summit 2010: Early Childhood Through Higher Education*, local foundation, education and community leaders have coalesced to develop a first-ever strategic approach to addressing the education continuum challenges faced by our students.

For the past six plus months, the Samueli Foundation and Broadcom Foundation have worked together towards creating an infrastructure and website to provide a platform for strategic thinking and program implementation. We have committed significant resources in the form of hiring a full time staff person to run the initiative, as well as a part time staff person to run a sub-component known as National Lab Network. Broadcom has developed a state of the art website that will serve as the convening technology to support the work developed.

For this initiative to be successful, it needs seed funding, along with our commitments, to attract the requisite resources needed to ensure adequate capacity. The Commission's participation, as recommended, will provide that critical initial capacity.

Unfortunately, I cannot be present to share these thoughts with you. I hope you will look favorably on the recommendation and partner with us, and others, to positively impact the educational opportunities for our community's children.

Thank you.

Gerald Solomon,
Executive Director

Early math skills predict later academic success

UCI researcher also finds K-5 students with persistent numeracy issues much less likely to graduate from high school

Continuing research by UC Irvine Distinguished Professor of education Greg Duncan has shed additional light on what constitutes school readiness and which K-5 skills and behaviors predict later academic success.

“Until recently, there has been little agreement on this topic,” he notes. “Most kindergarten teachers recognize the inability to follow directions, trouble working independently or in groups, and a lack of academic skills as factors associated with difficult transition to the school environment.”



Michelle S. Kim / University Communications

A study involving 16,387 children showed no correlation between behavioral problems in elementary school and subsequent scholastic achievement, but early math skills played a big role.

However, one National Research Council report argues that social and emotional aptitude is just as important as language and cognition in young children’s scholastic achievement. Another NRC report emphasizes the importance of early acquisition of linguistic skills. And the National Council of Teachers of Mathematics urges high-quality math instruction for 3- to 6-year-olds.

To address this issue, Duncan and colleagues identified six population-based data sets – involving 16,387 children – that included measures of reading and math competency, attention skills, pro-social behavior, and antisocial and internalizing behavior taken around the time of school entry, as well as measures of reading and math competency taken later in the primary or middle school years.



“We found that only three of the school-entry measures predicted subsequent academic success: early reading, early math and attention skills, with early math skills being most consistently predictive,” Duncan says.

“Early behavior problems and social skills were not associated with later reading and math achievement. These patterns generally held both across studies and within each of the six data sets examined.”

His analysis is widely viewed as providing a clear answer about the relative role of school-entry skills and behaviors: Early academic skills appear to be the strongest predictor of subsequent scholastic success – early math skills more so than early reading skills.

"A student's school-entry ability to pay attention and stay on task is modestly predictive of later achievement, while early problem behavior and other dimensions of social and mental health issues are not at all correlated," Duncan elaborates. "If school readiness is defined as having the skills and behaviors that best predict subsequent academic success, concrete numeracy and literacy skills are decidedly more important than socio-emotional behaviors."

He and Katherine Magnuson of the University of Wisconsin-Madison recently completed a second study using two large data sets (2,843 children) and the same achievement, attention and behavior measures. They determined that K-5 students with persistently low math skills were much less likely to graduate from high school or attend college.

Surprisingly, chronic reading problems were not predictive of these outcomes, after accounting for the fact that children who struggle with reading tend to also struggle with math. In contrast to the first study's findings, persistent antisocial behavior was correlated to dropping out of high school and not attending college. But chronic difficulty paying attention and internalizing behavior were not predictive of this.

The math results were quite striking. Children with persistent math problems in elementary school were 13 percentage points less likely to graduate from high school and 29 percentage points less likely to attend college.

"The next level of research should focus on why math skills – which combine conceptual and procedural competencies – are the most powerful predictor of subsequent achievement and attainment," Duncan says. "Experimental evaluations of early math programs that focus on particular skills and track children's reading and math performance throughout elementary school could help identify missing causal links between early skills and later success."

— Nancy Christensen, *Education Communications*

CHILDREN AND FAMILIES COMMISSION OF ORANGE COUNTY

RESOLUTION NO. ___-11-C&FC

July 6, 2011

A RESOLUTION OF THE CHILDREN AND FAMILIES COMMISSION OF ORANGE COUNTY DIRECTING THE EXECUTIVE DIRECTOR TO PREPARE AND NEGOTIATE AGREEMENT NO. C-286 WITH VOLUNTEER CENTER OF GREATER ORANGE COUNTY, dba ONE OC; AND MAKING CERTAIN FINDINGS IN CONNECTION THEREWITH

WHEREAS, in order to facilitate the creation and implementation of an integrated, comprehensive, and collaborative system of information and services to enhance optimal early childhood development, the legislature adopted legislation set forth in the California Children and Families Act of 1998, Health and Safety Code Section 130100, *et seq.* (as amended, the “Act”) implementing the Children and Families First Initiative passed by the California electorate in November, 1998 and establishing the California Children and Families Commission and County Children and Families Commissions, including this Children and Families Commission of Orange County (“Commission”); and

WHEREAS, Commission adopted its Strategic Plan to define how funds authorized under the Act and allocated to the Commission should best be used to meet the critical needs of Orange County’s children prenatal to five years of age as codified in the Act; and

WHEREAS, the Executive Director and Commission Counsel have prepared a standard Master Agreement for Consultant/Professional Services (“Master Agreement”), which was approved by the Commission; and

WHEREAS, the Commission desires to authorize the Executive Director or designee to prepare and negotiate Agreement No. C-286 with Volunteer Center of Greater Orange County, dba OneOC in an amount not to exceed \$250,000, to provide services related to the Orange County (OC) STEM (Science, Technology, Engineering, and Mathematics) Initiative for the period July 1, 2011 through June 30, 2014, as specified in the July 6, 2011 staff report for this Agenda Item; and

WHEREAS, Commission has reviewed the staff report relating to the Scope of Services to be provided and hereby finds and determines that the proposed Agreement is in furtherance of and consistent with the Commission’s Strategic Plan; and

NOW, THEREFORE BE IT RESOLVED BY THE COMMISSIONERS OF THE CHILDREN AND FAMILIES COMMISSION OF ORANGE COUNTY AS FOLLOWS:

Section 1 Commission finds and determines the foregoing Recitals are true and correct and are a substantive part of this Resolution.

Section 2 Commission hereby authorizes the Executive Director, or designee, to prepare and negotiate the terms, conditions and final form of Agreement No. C-286 with Volunteer Center of Greater Orange County, dba OneOC, in an amount not to exceed \$250,000, to provide services

related to the OC STEM Initiative for the period July 1, 2011 through June 30, 2014, as specified in the July 6, 2011 staff report and scope of services referenced therein; and

Section 3 The form of Agreement No. C-286 with Volunteer Center of Greater Orange County, dba OneOC shall be substantially similar to the form of the standard Master Agreement, subject to minor, non-substantive revisions as reviewed and approved by the Executive Director or designee. The approval by the Executive Director of Agreement No. C-286 shall be conclusively evidenced by the execution and delivery of the Agreement by the Commission Chair to the Commission Clerk.

Section 4 Commission hereby approves Agreement No. C-286 with Volunteer Center of Greater Orange County, dba OneOC to provide services related to the OC STEM Initiative as specified in the July 6, 2011 staff report for this Agenda Item.

Section 5 The Commission Chair and the Clerk of the Commission are hereby authorized to execute and attest, respectively, Agreement No. C-286 on behalf of the Commission.

Section 6 A copy of the final Agreement No. C-286 with Volunteer Center of Greater Orange County, dba OneOC, when executed by the Commission Chair, or Executive Director, and attested by the Clerk of the Commission shall be appended hereto as a part of Exhibit A to this Resolution. Exhibit A is hereby fully incorporated as a part of this Resolution by this reference and made a part hereof. The final executed Agreement shall be placed on file in the office of the Clerk of the Commission.

Section 7 In addition to the authorization of Section 2 above, the Executive Director (or his designee) is hereby authorized, on behalf of the Commission, (i) to sign all documents necessary and appropriate to carry out and implement the Service Agreement, (ii) to cause the issuance of warrants, (iii) to administer the Commission's obligations, responsibilities, and duties to be performed under such agreement, and (iv) during the term thereof to provide waivers, administrative interpretations, and minor modifications of the provisions of such agreement in the furtherance thereof.

Section 8 The Clerk of the Commission shall certify to the adoption of this Resolution.

The foregoing resolution was passed and adopted by the following vote of the Children and Families Commission of Orange County on July 6, 2011 to wit:

AYES: Commissioners: _____

NOES: Commissioner(s): _____

EXCUSED: Commissioner(s): _____

ABSTAINED: Commissioner(s) _____

CHAIR

STATE OF CALIFORNIA)
)
COUNTY OF ORANGE)

I, DARLENE J. BLOOM, Clerk of the Commission of Orange County, California, hereby certify that a copy of this document has been delivered to the Chair of the Commission and that the above and foregoing Resolution was duly and regularly adopted by the Children and Families Commission of Orange County.

IN WITNESS WHEREOF, I have hereto set my hand and seal.

DARLENE J. BLOOM
Clerk of the Commission, Children and Families Commission of
Orange County, County of Orange, State of California

Resolution No: __-11-C&FC

Agenda Date: July 6, 2011

Item No. ____



I certify that the foregoing is a true and correct copy of the Resolution adopted by the

DARLENE J. BLOOM, Clerk of the Commission

By: _____
Deputy

EXHIBIT A TO RESOLUTION OF COMMISSION

(Attach copy of final executed Agreement No. C-286 with Volunteer Center of Greater Orange County, dba OneOC)