San Diego Unified School District

Magnet Schools Assistance Program Grant Application (2016–19)

Program Narrative

Table of Contents

		Page
280.32	**Competitive Preference Priorities**	2
	Priority 1: Need for Assistance	2
	Priority 4: Promoting Science, Technology, Engineering and Mathematics (STEM) Education	14
	Priority 5: Supporting Strategies for which there is Evidence of Promise	24
	IP: SES Integration	26
280.31	**Selection Criteria**	
	(a) Desegregation	29
	(b) Quality of Project Design	59
	(c) Quality of Management Plan	98
	(d) Quality of Personnel	124
	(e) Quality of Project Evaluation	136

San Diego Unified School District

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Competitive Preference Priority 1—Need for Assistance (0-5 points)

(a) The costs of fully implementing the magnet schools project as proposed;

Introduction

The San Diego Unified School District (SDUSD) serves more than 130,000 students in pre-school through grade 12 and is the second largest district in California. The student population is extremely diverse, representing more than 15 ethnic groups and more than 60 languages and dialects.

Since its founding on July 1, 1854, the district has grown from a small, rented school building with one teacher to its current size—more than 226 educational facilities with 13,559 employees. Nearly 6,000 teachers are in classrooms at the district's various educational facilities, which include 117 traditional elementary schools, 9 K-8 schools, 25 traditional middle schools, 24 high schools, 49 charter schools, and 14 atypical/ alternative schools. SDUSD has a strong history of developing and sustaining Magnet programs, proudly offering 26 Magnet schools Kindergarten through grade 12.

In the 2016 Magnet Schools Assistance Program (MSAP) application, SDUSD is proposing to strengthen its Magnet program by building a K-12 STEAM Magnet articulation pathway that will attract students from different social, economic, ethnic, and racial backgrounds. The proposed MSAP Magnet project will fill the gaps in the District's Magnet school continuity across the STEAM theme by developing three new STEAM Magnets—Carson and Linda Vista at the elementary level and Montgomery at

middle level—creating a STEAM pathway to the Kearny High Complex STEAM Magnet School. Kearny is an existing STEAM Magnet, which is attracting a diverse population, but lacking in enrollment partially due to lack of an articulation pathway.

The San Diego Unified School District (SDUSD) requests MSAP funding to implement *Designing a STEAM Pathway in the SDUSD* for the purpose of developing the three STEAM Magnet schools, creating the STEAM articulation pattern within the Linda Vista community of SDUSD. The three sites to be included in the project, Carson Elementary, Linda Vista Elementary, and Montgomery Middle, are experiencing increased minority group isolation among Hispanic students. Each will be a new magnet school, adding to SDUSD's strong commitment to the role of magnets in facilitating diversity. These three new magnet sites will feed into The Kearny Complex, a STEAM Magnet High School that is successful in its primary goal of attracting a diverse student body and has ample seating available for a robust pipeline of students preparing for STEAM-related futures.

Designing a STEAM Pathway in the SDUSD is projected to support approximately 1,626 students and 92 classroom teachers, support teachers, and administrators by the close of the grant. Funding will make possible the following critical components of the project design: District-level support and project management; imaging, marketing, and recruitment; STEAM-related professional development and curriculum design in support of student achievement; STEAM materials and equipment; family and community engagement; and a comprehensive evaluation. All components are necessary to implement *Designing a STEAM Pathway in the SDUSD.*

Project management personnel necessary to the coordination and oversight of the magnet project include a Director, a Project Manager, a STEAM Specialist, and a Marketing and Arts Specialist. The Director will have full responsibility for the design, implementation, communication, and collaboration at the school, district, and community levels, and for the sustainability of the project. The Project Manager will assist the Director in these duties, support sites with vision and mission development, and oversee the implementation of the Learning On the Go (LOGO) program, a one-to-one take home device initiative, as well as collaborate with the STEAM and Marketing and Arts Specialists to ensure alignment of professional development, curriculum development, and other supports to bring the program vision to fruition. The STEAM Specialist will develop and sustain STEAM-related professional learning for all sites, and develop a network of professional learning relationships among the sites, SDUSD, and university and community partners. District departments such as Visual And Performing Arts (VAPA), College and Career Technical Education (CCTE), and translation, will provide vital support as well as ensure sustainability partnerships within the district at no cost to the grant.

Imaging, marketing, and recruitment activities are necessary for MSAP sites to meet and sustain their diversity goals. The STEAM Marketing and Arts Specialist will lead the development of imaging and marketing plans in conjunction with the development of sites' vision and mission, research for targeted marketing, and the development of branding visuals, fliers, and marketing materials such as brochures and informational folders, and engage site personnel to ensure the transition and sustainability of processes and expertise as staff turnover occurs.

Strong, embedded, and sustained professional development will be at the core of the three sites' transformation into STEAM Magnets. Fully transitioning to true STEAM teaching and learning requires teachers to adopt new methodologies as they shift to student-centered inquiry. Yet, the District's Science Advisory Blue Ribbon Committee and the Math Task Force subcommittee found that many elementary teachers lack the depth of scientific and mathematic content and process knowledge necessary to increase student competencies in STEAM. Funding cuts have left the District with only nine K-12 Common Core State Standards (CCSS) Mathematics and one Next Generation Science Standards (NGSS) K-12 Science and Engineering Resource Teachers to support over 6,000 teachers.

Implementing STEAM at the elementary and middle school levels will require effective, sustained professional development from a range of professionals with deep disciplinary and pedagogical competencies. Not only will teachers need to build competency in the individual disciplines contained in STEAM instruction, but cross-disciplinary inquiry-based instruction will be the goal. Two STEAM-RTs per site will offer teachers direct access to content and pedagogical support. STEAM-RTs will work in concert with the Director, Manager, and STEAM Specialist to tailor opportunities to site needs, enabling the infusion of STEAM content into the daily instructional life of the school through workshops, PLCs, and individual support necessary to improve teaching and learning, with the ultimate goal of increasing student achievement. The STEAM-RTs will also support purchasing, marketing, partnership development, and community engagement.

Partnerships with local and national experts will support curricular enrichment and PD initiatives. The University of San Diego's Mulvany Center, located in the Linda Vista community, will bring Magnet educators the opportunity to design social action into the STEAM units through collaborative involvement in community outreach. A contract with World Savvy, an organization focused on developing global citizenship through the design of interdisciplinary, problem-based inquiries with community outreach, will support the middle school teachers in developing interdisciplinary STEAM curricula with the potential to maximize the opportunities presented by The Mulvany Center. The development of an Early Learner Collaborative, with the contracted support of Professor Peter Johnston from State University New York (SUNY) Albany will bring a focus on the reciprocity between inquiry and agency to the primary teachers at both elementary sites. Funding also will be provided for Administrators and teachers to attend local and national level STEAM-related professional growth opportunities, and access USD's master's level online STEAM courses. Funding will be included for Magnet Schools of America conferences as well to introduce site staff to the national level community of Magnet Schools, with the ultimate goal of disseminating learning.

STEAM materials and equipment are necessary as classrooms lack the curricular supports and materials necessary to implement rigorous, interdisciplinary STEAM teaching and learning. SDUSD currently uses Full Option Science Systems (FOSS) Kits at the elementary level for elementary science instruction. While the FOSS kits are available to teachers, refurbishment of the materials is based on scarce site funds, and professional development to support an inquiry approach and the understanding of science process is not available. Too, new Next Generation Science Standards-aligned

FOSS kits have been developed, but sites do not have funding to purchase these. As the district does not yet offer elementary-level engineering curriculum, materials, or professional development, there are no resources to support implementation. MSAP funds will be used to purchase Engineering is Elementary, a research-based engineering curriculum developed by the Boston Museum of Art in conjunction with engineers in the field of focus for each unit, and Project Lead the Way Launch, a research- and research-based curriculum blending science and engineering instruction.

At the middle school level, science teachers will be preparing to reorganize courses under the new demands of the NGSS. Teachers at each grade level will now be designing courses for each branch of science, requiring not only time to work collaboratively on curriculum writing, but the purchasing of new tools and equipment. Materials for engineering are restricted to the San Diego State University Mathematics, Engineering and Science Achievement Program and Project Lead the Way courses. Classroom teachers in other content areas do not have the tools and materials needed as they work to design interdisciplinary units that engage students in engineering practices. Each site at both the elementary and middle school level will use MSAP funds to update/replace arts materials to support an interdisciplinary design that incorporates the arts as a means of thinking, creating, and communicating. Mathematics materials need to be updated as well to enable the design of mathematics instruction that incorporates the demands of the CCSS for Mathematics. Site library holdings will be enhanced and classroom libraries developed with texts necessary to the design of interdisciplinary, problem-based units that incorporate real-world issues, enabling the STEAM curriculum to meet CCSS literacy standards.

The development of inquiry and problem-based interdisciplinary STEAM teaching and learning requires integrating technology into instruction in meaningful ways. Differing technologies are necessary for robotics work, teaching of technology, and science and arts integration. The purchasing and initial training of the district's i21 technology was heavily weighted towards basic operations. MSAP funding will allow the purchase of advanced tools in numbers sufficient for collaborative inquiry practices, robotics, and video production, as well as a transition to LOGO, a one-to-one take-home program at both the elementary and middle school level. The development of a Maker Space at each site will require furniture such as tables intended for collaborative tinkering, design and constructing, specialized tools, equipment and technology, and a range of arts and building supplies, plus storage supports.

MSAP funding will also support STEAM integration into family and community activities, as actively engaging both are critical factors for recruitment, student success, family commitment, and sustainability. The STEAM Marketing and Arts Specialist will work with sites to develop community events and support sites' participation in these events. A contract with 3Rs Robotics, a leading partner in the greater San Diego STEAM community, will support the sites in developing an annual STEAM Fair for marketing and general educational purposes, not only designing and supporting the event, but mentoring site and community leadership for sustainability purposes.

A budgeting process thoughtfully aligned to the goals for *Designing a STEAM Pathway in the SDUSD* projects the costs of fully implementing the magnet schools project as proposed across three years at $10,317,717. Each category of this budget

has been aligned to goals, and the personnel, equipment, supplies, and opportunities necessary to fully achieve the vision in support of students and their families.

(b) The **resources available** to the applicant to carry out the project if funds under the program were not provided;

Without the support of MSAP funding, SDUSD will have limited resources to implement *Designing a STEAM Pathway in the SDUSD.* Because of its dedication to diversity and the promise of STEAM teaching and learning, leadership at the district level and the proposed sites are dedicated to supporting these magnets as proposed; however, in the absence of MSAP funding, the robust plans described in this application could not be fully actualized.

The District's Visual and Performing Arts (VAPA) department is dedicated to interdisciplinary inclusion of the arts as a tool for thinking and communicating, and is already planning with the Office of School Innovations for collaboration of its Resource Teachers. District-funded CCSS Resource Teachers for Literacy and Mathematics work with sites, offering professional development. District-funded English Language Learners (ELL) Teachers support sites with instructional pedagogies utilizing Quality Teaching for English Learners (QTEL) strategies for curriculum design and assessment designed to meet the needs of students for whom English is not their first language. The District's Ed Tech Department is working with the proposed sites in improving student achievement through the infusion of technology into the learning process. Through Propositions S and Z, funded by bond measures, Ed Tech has developed and is supporting the i21 Interactive Classroom Initiative, a district-wide, phased-in plan to supply technology and professional development that emphasizes learning *with*

technology, as opposed to merely learning *about* technology. The Parent Translations Department supports sites with efforts to develop and maintain open communication with all families. The District's Enrollment Options office handles the district's Choice application process and will be supporting the marketing of sites by highlighting them in the district's yearly enrollment options catalogue.

The Site-Based Budgeting process puts decisions with discretionary funds into the hands of site leadership in collaboration with their community representation. Magnet sites are able to use their Categorical Funds and Site Discretionary Funds to fund the development of a STEAM theme. Categorical Funds include funds from Title I and other federal and state programs, which are used for services that contribute directly to student academic achievement and support the District's Single Plan for Student Achievement such as instructional materials, professional development, and parent involvement. Site Discretionary Funds are based on enrollment and school type, and usage is determined by the school community. Programs and services that can be funded with this allocation include school counselors, Resource Teachers, supplies, and class-size reduction teachers. All STEAM MSAP sites have pledged to use their Categorical Funds and Site Discretionary Funds to support the design, implementation, and sustaining of the STEAM program. STEAM sites will receive added allotment for a STEM/STEAM district priority as described in Quality of Project Design, sub-section 2.

Many of the proposed partnerships will support the sites to the degree possible. USD, inclusive of the Mulvaney Center, has pledged support to the three sites, and is already working to bring student interns on campus to support students. 3Rs Robotics

will support with entry in San Diego STEAM events, and Biocom, a local life sciences consortium, will offer industry networking.

(c) The extent to which the costs of the project exceed the applicant's resources; and

Without MSAP funding, SDUSD will not be able to implement *Designing a STEAM Pathway in the SDUSD* as designed. Draconian budget reductions dating back to 2007 have severely challenged the district to provide basic supports to its 226 educational facilities and 6,000 teachers serving over 130,000 students. While there was a slight recovery from the worst of the recession, the budget picture is on a downward slide again. SDUSD is projecting a $68.6 million budget shortfall for the 2016-17 school year. As a partial solution, $44 million is set aside from the current school year and $24.6 million will be pulled from the 2016-17 general fund to cover operational costs, resulting in cuts to spending on academic programs and educational supports such as professional development, innovative program design, and instructional materials. The budget shortfall in 2017-18 is projected to increase, with $108.8 million anticipated being pulled from the general fund as a partial solution to support operational costs. The result again will be increased cuts to academic programs and educational supports.

A primary contributor to the budget gap is decreased state funding. A January 2016 Washington Post article reported that the nation's per-pupil spending on K-12 public schools dropped in 2013 for the third year in a row, reversing more than a decade of funding increases (Brown, 2016). Proposition 30 was passed as a temporary measure by the voters of California in November 2012, with a goal of enabling the state to begin to refund cuts to school districts, including the more than $450 million cut from

SDUSD. Preparing to Launch, a special supplement to Quarterly Counts, Education Week's annual analysis of school finance, examined educational expenditure patterns and the distribution of those funds within states. Even with Proposition 30, however, at $8,308, California ranked 46th in adjusted per-pupil expenditures (Proposition 30 now sunsets December 31, 2016, with no plan for replacing the funding). The national average for the same period was $11,735, earning California a D+.

In SDUSD, Title II funds for Professional Development decreased dramatically three to four years ago, and have remained relatively flat ever since. Supply Budgets have been slashed to a point where only the most urgent needs can be considered, as illustrated in Table 1, Grant Site Supply Budget Comparison, below:

Table 1. Grant Site Supply Budget Comparison

	2009 pre-recession supply budget	2016-17 supply budget
Carson	$182,470	$47,522
Linda Vista	$151,721	$40,468
Montgomery	$377,097	$63,083

(d) The difficulty of effectively carrying out the approved plan and the project for which assistance is sought, including consideration of how the design of the magnet schools project—*e.g.,* the type of program proposed, the location of the magnet school within the LEA—impacts the applicant's ability to successfully carry out the approved plan.

All three proposed Magnet sites are in corrective action, entering their 5th year of Program Improvement during the 2015-16 school year. While the District as a whole had a higher percentage of students scoring proficient or advanced than the State average on the California Standards Test in Science in the 2014-15 school year (State average was 56%, District average was 65%), both Carson and Linda Vista scored below the state and District average with scores of 44% and 29%, respectively. Although the District Mathematics scores averaged higher than the State average in the percentage of students meeting or exceeding standards (33% at the State level, 41% at the District level), only 35% of Carson and 21% of Linda Vista students met or exceeded State standards. Montgomery Middle also scored below the State and District average for Science, with 50% of their students scoring proficient or advanced. In Mathematics, 23% of students met or exceeded standards.

The achievement challenges confronting the three proposed magnet schools are compounded by increasing poverty and the increase in the numbers of English language learners at the schools. At Carson Elementary, 96.6% of students are free and reduced-price lunch eligible. Rates at Linda Vista Elementary and Montgomery Middle are 93.8% and 92%, respectively. This level of poverty means that students often lack access to school supplies, high-level learning materials, and technology at home. Many students also lack English skills sufficient for rapid acquisition of STEAM content and texts in English (informational texts often pose challenges for English Language Learners).

These factors have led many parents to seek other education options for their children, including other district schools, charter schools, or private schools. As a result,

minority group isolation has increased for Hispanic students at all three sites. Compared to the district enrollment average of 44.7% Hispanic students, Carson currently sits at 62.8%, Linda Vista at 76.2%, and Montgomery at 64.5%.

Designing a STEAM Pathway in the SDUSD is designed to address these instructional issues and raise STEAM achievement in all three schools. The magnet project will improve teacher STEAM content/process knowledge, strengthen pedagogical skills, and create inquiry-based, problem-based classrooms. These positive, transformational changes to the three school communities will give residents of the Linda Vista community a reason to take another look at their neighborhood schools and slowly reverse the growing trends of SES segregation and MGI.

Competitive Preference Priority 4—Promoting Science, Technology, Engineering, and Mathematics (STEM) Education (0-5 points)

Projects that are designed to improve student achievement (as defined in this notice) or other related outcomes by supporting **local or regional partnerships** to give students **access to real-world STEM experiences** and to give educators **access to high-quality STEM-related professional learning**.

In preparation for transforming Carson, Linda Vista, and Montgomery into STEAM Magnet schools, SDUSD has engaged with a range of local and regional partnerships with the intent of building a STEAM learning ecosystem to give students access to real-world STEAM experiences, and to give educators access to high-quality STEAM-related professional learning. This STEAM ecosystem will be a dynamic collaboration among

the proposed Magnet schools and the school district; expert institutions including museums, consultants, and an institution of higher education; local STEAM-related industry; community-based organizations; and families. This STEAM ecosystem will harness the unique contributions of each partnership, offering all students and families access to STEAM-rich learning environments across the K-8 STEAM pathway.

Furthermore, the opportunities created will enable the development of important skills and engagement in science, technology, engineering, arts and mathematics in ways that develop awareness, engagement, knowledge, and skills in STEAM disciplines and processes. Of equal importance, students will develop a qualitatively different way of engaging with their world: seeing and solving problems, learning to think critically, engaging productively with each other and with challenge, communicating with clarity, and applying understanding to real-world scenarios.

The STEAM ecosystem will focus on engaging all students, particularly those who have been historically under-represented in STEAM, by offering real and relevant STEAM learning experiences. The ecosystem of partners will ensure students have opportunities to meet and build mentoring relationships with STEAM professionals from similar backgrounds who serve as role models, and develop the belief that they too can aspire towards a career in STEAM-related arenas. The range of STEAM partners will provide opportunities for students to take part in authentic STEAM experiences beyond their engagement in developing STEAM interdisciplinary units during school day. These opportunities are woven throughout the varied partnerships, and in the form of extended learning options that enable students to engage in authentic inquiries and activities with STEAM practitioners.

Each of SDUSD's current or proposed partnership falls into one or both of two categories: (1) disciplinary, curricular, and/or pedagogical support; and (2) community and/or industry collaboration. Each partnership is the result of networking, conversations, and and/or shared efforts in other projects and aligns with the SDUSD MSAP project vision. The role of each partnership has been discussed in length in the Quality of Project Design section. A summary of the salient aspects of these critical partnerships follows.

Disciplinary, curricular, and/or pedagogical partnerships

The **University of San Diego** (USD) is located a few short miles from the proposed STEAM Magnet sites. USD is a Changemaker Campus—a designation awarded to higher education campuses paving the way in social innovation education by transforming educational experiences into world-changing experiences. SDUSD's MSAP project will be partnering with USD's **Mulvaney Center for Awareness, Community and Social Action**, the center of USD's Changemaker effort. The Mulvaney Center has committed to creating an ecosystem of positive and sustainable social change in the Linda Vista Community, home to our three proposed MSAP sites. SDUSD has the demonstrated commitment of USD and its Mulvaney Center at both the project level and the individual site level, as evidenced by the letters of support from USD (Attachment 5). As a Changemeaker hub, USD is working to develop a corridor of sustainable change in Linda Vista, developing wrap-around services for three schools. USD offers in-kind funding in the way of academic support for students, professional support for teachers, and family and community services through the Bayside Center, a community center located adjacent to Carson elementary. USD will work in

collaboration with District and project leadership on the Steering Committee, offering operational support for the cohesiveness and sustainability of the STEAM pathway. USD has also pledged extensive academic support for teachers through the Mathematics and Computer Science Department, as well as the College of Arts and Sciences, and the Shiley-Marcos School of Engineering. Teachers from all levels will have opportunity to work with these experts in Professional Learning Communities (PLCs).

World Savvy, a national education nonprofit working with educators, schools, and districts to integrate global competence teaching and learning into K-12 classrooms with a focus on historically marginalized students, will work with the proposed middle school STEAM Magnet and upper-grade teachers from the two proposed elementary sites. World Savvy's added support in designing interdisciplinary STEAM curricular units and the accompanying pedagogical shifts will develop processes and depth of understanding that enable teachers to sustain efforts beyond the grant, and prepare students to engage, succeed, and meet the challenges of 21st century citizenship. With World Savvy's support, students will be connected digitally with students elsewhere exploring similar global issues, offering opportunity to communicate process, understandings, and action, and receive feedback.

The **Teachers Development Group** (TDG) is a nonprofit whose mission is to improve all students' mathematical understanding and achievement through meaningful, effective professional development for teachers and school leaders. TDG focuses on deepening teachers' and school leaders' knowledge of mathematics content, pedagogy, and leadership; building system-wide capacity to design, implement, and sustain

instruction that aligns with research on how students learn mathematics; assuring that all students engage continuously at high-cognitive levels in mathematically productive habits of mind and habits of interaction; fostering the development of every student's mindset and self-identity as a capable mathematical thinker; and providing tools, strategies, and structures that will support a self-sustained culture of continuous mathematics professional learning and growth. Teachers will rotate into work with the TDG at different points across the three years of the grant, with the goal of strengthening mathematics integration in STEAM.

SDUSD will be working with a range of partners to support the infusion of the arts into STEM. **Art Reach**, **CoTA**, **Arts for Learning**, and the **San Diego Museum of Arts** will support the MSAP project by bringing practicing artists into schools to work with teachers, students, and parents, with a goal of infusing arts throughout STEAM units as a means of construction, communication, and persuasion.

Good Neighbor Gardens has pledged support in building instructional and community gardens at each site. Good Neighbors works with students and teachers to incorporate gardens into STEAM curricula, and has developed a business model for a Community Supported Agriculture (CSA) program, using bounty from school gardens to meet community need, then funneling profit back into schools as a mechanism for sustainability of instructional support and garden upkeep. Students work to plan the business model, support the harvest, and plan for delivery of produce, and learn the impact of these actions on their neighborhoods.

3Rs Robotics will offer support in the design of Maker Spaces on campus, which offer opportunity for students to learn while actively engaged in designing and creating

projects to explore concepts. 3Rs offers professional development in 3D Thinking for teachers as a foundation for the use of 3D printers. 3Rs also offers extended learning options for students and families, developing robotics competitions and maker/design challenges.

Finally, **Treobytes**, a nonprofit run by a practicing engineer, will provide students and teachers opportunity to learn coding using Scratch and Mindcraft platforms. Coding clubs will be offered as extended learning options, with learning presented in the form of challenges and competitions.

Community and/or industry collaborations

Biocom, a regional consortium serving the southern California life sciences business community, offers professional support in the way of mentors and speakers, access to STEAM events county-wide, donations of surplus science tools, access to their vast communication network to share news of the STEAM magnet sites, and the potential to network and develop added business partnerships. Biocom Institute, the non-profit workforce development and STEM arm of Biocom, sponsors a week-long San Diego Science Festival to improve education in San Diego by bringing together community and corporate leaders to provide programming and pre-workforce development for the next generation of scientists. The Biocom Institute outreach coordinator will work with the MSAP Marketing and Arts Specialist and STEAM-RTs to plan and support magnet site participation.

3Rs will support participation in authentic STEAM activities by mentoring teachers and parent organizations to participate in STEAM events in the greater San Diego area,

such as the STEAM Maker Fest, the San Diego Science and Engineering Festival, and the STEAM Expo.

Additionally, **SDUSD's College and Career Tech Education** (CCTE) department has worked to cultivate over 800 local business partnerships. As San Diego has a strong STEAM-related industry base, many of the partnerships are with STEAM-related entities. CCTE will work with MSAP grant schools to provide access to STEAM industry leaders for the purpose of developing industry mentors to work directly with students, parents, and teachers to create awareness of STEAM-related career opportunities and an understanding of the necessary academic pathway. Efforts will also be made to reach out to the area's defense and aviation industry to develop partnerships that honor the history and support prospects for the future.

Regarding the second component of CPP 4, SDUSD has designed opportunity to build teacher's professional capacity for STEAM teaching and learning through high-quality relevant professional development, including cross-sector experiences and learning opportunities. SDUSD will implement a multi-tiered professional development plan, aligning district support with partnership support. This plan includes workshops, teacher-to-teacher professional development, and peer coaching that targets content knowledge and pedagogical practice; understanding and incorporation of design thinking; assistance in implementing CCSS and NGSS; creation and use of STEAM curriculum in the form of interdisciplinary units; and purchasing of resources aligned to CCSS, NGSS, state standards, and the developing STEAM units.

The partnerships described above, with the exception of Biocom, offer a comprehensive range of classroom-embedded professional development support.

These supports include greater understanding of inquiry-based instruction, support for interdisciplinary curricular design with an emphasis on arts integration, understanding and integration of engineering and design process, connecting STEAM inquiries to the community, and strengthening mathematics and science instruction. They also serve to introduce teachers to STEAM-related workplaces, developing their understanding of the aptitudes and collaborative abilities students need to develop.

A critical feature of the professional development is having adequate, specialized support for teachers. Professional support will start at the school level, where two STEAM-RTs will provide ongoing and embedded professional development complete with workshops, coaching, and the infusion of STEAM topics and design thinking into conversations about teaching and learning in PLC sessions. They will support curriculum writing, demonstrate teaching in STEAM subjects, and provide guidance in the purchase of materials. PLCs, which have been minimally established at the three schools, will be enhanced through added time to meet provided by visiting teacher funding in the MSAP grant. The PLCs will be set up so teachers work collaboratively to share best practices for achieving better results for their students, focus on the analysis of student performance data and determine instructional gaps, plan for next steps, monitor student progress towards proficiency, and revise curriculum accordingly.

STEAM-RTs' support will include best use of purchased support materials, such as the newly available NGSS-aligned FOSS kits for Science instruction, Engineering is Elementary, and Project Lead the Way. Although some materials, such as pre-NGSS FOSS, have been available to teachers, PD to support an inquiry approach and the understanding of disciplinary processes has not. Currently, teachers use curriculum to

the best of their ability, but direct teaching models, as opposed to student inquiry, often prevail. The Central Office MSAP team, composed of the Director, Project Manager, STEAM Specialist, and Marketing and Arts Specialist, will fill this gap so that maximum benefit can be obtained from grant-funded instructional materials.

The MSAP Project Manager and the STEAM-RTs will also work to strengthen each teacher's awareness of the possibilities a Learning on the Go (LOGO) program, which provides computers to travel home to school, brings to teaching and learning. Teachers received initial training with student computers through the District's i21 funding, but the training was weighted towards the basic operation of the equipment, and students have not had the option of taking them home. Emphasis will be on increasing teachers' comfort level with the equipment, meaningful integration of technology with ongoing instruction, and strategies for continued learning at home.

Beyond the site-level support, the Central Office MSAP team will meet a minimum of twice a month with the STEAM-RTs to offer professional development that lifts their level of understanding of STEAM teaching and learning. The Central Office MSAP team will also provide classroom teachers with support and professional development across the magnet schools, creating cross-site collaboration, collaboration with ongoing district initiatives and teams, alignment of day-to-day support with the support offered by project consultants, and large-scale workshops designed to consistently move work towards project benchmarks. These workshops will include several full-day STEAM Saturdays and a STEAM Summer Institute each year of the grant, bringing teachers from the proposed sites together to share struggles, insights, and progress with their understanding of STEAM, the design of interdisciplinary STEAM curriculum, disciplinary

processes, design thinking, and the supporting pedagogies. This support will help build the professional relationships and networking necessary to build sustainable processes for collaborative adult learning beyond the close of the grant. Methods will include organizing cross-site visits highlighting best practices, leading cross-site PD, and the integration of support from the district partnerships.

Funding in the travel budget will provide administrators and teachers opportunity to attend local and national STEAM-related conferences. Events such as the National Science Teachers Association Conference, National Council of Teachers of Mathematics Conference, National Arts Educators Association Conference, South by Southwest, Ed Tech Teacher Innovation Summit, the Future of Learning Institute, and the Magnet Schools of America Conference enable teachers to network, explore innovative teaching and partnership practices, and envision new possibilities for themselves and their students. The central office MSAP team and site staff will attend varied conferences, collaboratively planning session choices prior, debriefing during, and sharing learning and implementation strategies after the conferences.

Finally, USD has developed an on-line STEAM Master's program. Grant teachers will be offered MSAP support for a Master's level STEAM course, with emphasis on participation of site-based or cross-site teams to maximize learning and implementation through collaboration.

In sum, a robust, multi-tiered approach to STEAM professional development will dramatically increase the opportunities for high-quality professional development for teachers at the three proposed magnet schools.

Competitive Preference Priority 5 – Supporting Strategies for which there is Evidence of Promise (0-5 points)

Projects that propose a process, product, strategy, or practice supported by evidence of promise.

As part of the magnet initiative, SDUSD is proposing to provide extensive professional development to enhance the knowledge and skills of teachers across the school in integrating the mathematics, including the enVisionMATH curriculum, into the STEAM magnet programs. The professional development will provide the content and curricular materials to be used with the consulting support provided by the Teacher Development Group (TDG), as well as with the support of the MSAP STEAM team, and district CCSS Mathematics Resource Teachers. This professional development will be a mix of workshop and in TDG's Math Studio process, which is a form of lesson study.

enVisionMATH will support the development and implementation of the STEAM magnet programs by developing the mathematical competencies necessary for application during engineering and science processes embedded in STEAM units. This timely, relevant application will support meeting the MSAP objective to increase student achievement in mathematics.

Citation 1:

Resendez, M. & Azin, M. (2008). A Study on the Effects of Pearson's 2009 enVisionMATH Program. Planning, Research, Evaluation Services (PRES).

Weblink: https://www.pearsoned.com/wp-content/uploads/envisionmath_efficacy_study_year1_final_report.pdf

Included in Attachment 9.

Citation Outcomes: This study found that "students using enVisionMATH significantly improved over the course of the school year in the areas of math concepts and problem solving, math computation, math vocabulary, and communication in math. Specifically, results showed that enVisionMATH students demonstrated significant percentile gains of:

- 19 points on concepts and problem solving,
- 33 points on computation,
- 15 points on math vocabulary, and
- 36 points on math communication."

Furthermore, statistically significant improvements were seen for students in all subgroups by gender, race/ethnicity, special education status, and eligibility for free or reduced price meals.

The proposed SDUSD magnet program will provide the professional development necessary for all teachers to maximize the curricular scope and sequence and materials provided by enVisionMATH and ensure teachers have the knowledge, skill, and professional networking necessary to continue strengthening instruction, assessment and targeted support for students.

Relevance to Proposed Project: The intervention used in the study is Pearson's enVisionMATH, a rigorous academic program of study. The 2009 Pearson enVisionMATH program is a standards- and research-based elementary mathematics

instruction program. The program is designed to provide "problem-based, interactive learning opportunities that are enhanced by visual learning strategies to create more in-depth connections for students." It incorporates a combination of traditional and investigative learning that emphasizes embedded assessment and data driven remediation.

The SDUSD magnet initiative will implement the enVisionMATH through workshop, PLC and lesson study support at each site.

The cohort in the study was composed of 1,197 students including 608 control and 589 treatment students across eight schools. The demographics of the total population included 89.2% White students, 6.7% Hispanic students, 2.1% African American, and 2.1% Asian; 47.4% were in 2nd grade and 55.1% were in 4th grade. Across the SDUSD proposed magnet elementary schools, there are 895 students, of whom 4.0% are White, 4.9% are African American, 69.3% are Hispanic, and 16.5% are Asian.

FY 2016 Invitational Priority: Socioeconomic Integration

The Secretary encourages projects that propose to increase racial integration by taking into account **socioeconomic diversity in designing and implementing magnet school programs**. Projects may implement inter-district or intra-district integration strategies such as neighborhood preferences or **weighted lotteries**.

To ensure an effective process to recruit students from different socio-economic, ethnic, and racial backgrounds into the magnet schools, SDUSD utilizes an intra-district weighted lottery system. Every three years, the District's Office of School Innovation,

Enrollment Options and Neighborhood Schools, Data and Reporting Office, and Instructional Facilities and Planning engage in a process to sort the district's high school clusters, the main organizational structure for all schools in the district, into three groups based on socio-economic status derived from free and reduced meal eligibility.

Using fourth week enrollment data, all students are matched to their home high school (regardless of school of enrollment) through the Geographic Information System. A list of all students residing within each high school's boundaries is then sent to Data and Reporting. Names for each student residing inside a high school boundary are matched to free or reduced meal eligibility, creating a percentage of meal eligibility for students residing in each high school boundary, as opposed to the percentage for students actually enrolled in the site.

As free or reduced meal eligibility is confidential, a report is sent to the team showing only the percentage of resident students that are free or reduced meal eligible in each high school cluster. Using these data, the high schools are sorted into three groups, creating three socio-economic application groupings. Currently, the three groups are:

- Group 1: High schools with 0%-33% of resident students (regardless of school of enrollment) who are free or reduced meal eligible
- Group 2: High schools with 34%-66% of resident students (regardless of school of enrollment) who are free or reduced meal eligible
- Group 3: High schools with 67%-100% of resident students (regardless of school of enrollment) who are free or reduced meal eligible

Once received, all Magnet applications are sorted into one of the three groups using the student's home address/high school of residence. Each magnet site then has a weighted preference for applications from groups other than the group its own resident population is sorted into. For example, if a magnet is located in group one, applications from groups three and two are given preference. This is done through a computerized process, with the end goal of developing an application lists for available seating that is most likely to contain the socio-economic as well as racial-ethnic diversity each site needs to fulfill its diversity goals.

Once applications are sorted by the weighted lottery process, each is assigned a computer-generated random number within its priority category. In April of each school year, rank-order lists are computer-generated using the random numbers inside each academic/socio-economic grouping. A list, broken apart by grade level, is provided electronically to each Magnet school. Applications submitted after February 15 are added to subsequent lists by the date and time the application is received. Families are then contacted by list order directly by the Magnet school and offered enrollment for the following school year. Students who have made a commitment to a Magnet theme are given top priority to continue in that Magnet theme when articulating to the next level (from elementary to middle to high school), ensuring continued socio-economic diversity.

In addition to the weighted lottery for its Magnet schools, SDUSD works to increase racial integration by taking into account socioeconomic diversity through Choice options for students in schools identified for Program Improvement (PI). Parents are offered the option to transfer their students to another district school not identified for PI through the

support of the Neighborhood Schools and Enrollment Options office. Letters are sent to all eligible families communicating this opportunity. Low-performing students from low-income families are to given priority for admission to a non-PI school, and transportation is provided.

(a) Desegregation (30 points)

(1) The effectiveness of its plan to recruit students from different social, economic, ethnic, and racial backgrounds into the magnet schools. (34 CFR 280.31)

SDUSD has earned high marks from the Brookings Institution as having one of the best school-choice systems in the country. In 2012 and 2013, the district ranked in the top 10 for school choice among the 100 largest school systems in the United States. SDUSD offers a variety of excellent choices to families who wish to explore academic options. Enrollment choices are available to all students, including English Learners, Gifted and Talented Education (GATE), and Special Education students.

Furthermore, SDUSD has a rich history of developing and sustaining Magnet schools, dating back to a 1977 court order. The resulting network of 26 Magnet schools serves as the cornerstone of the District's desegregation efforts. Its success was cited in SDUSD's transition from a court-supervised desegregation order to a voluntary effort in 1996, with direction from the Court stating, "*The District shall continue the vigorous recruitment of students to participate in magnet programs… As practical, the District shall plan and implement magnet programs at new schools that will promote integration and academic achievement".*

As part of the continued effort to follow the Court's directive and strengthen its Magnet program, SDUSD has recently revised its voluntary desegregation plan, known as The San Diego Plan for Racial, Ethnic, and Socio-economic Diversity. This plan, along with a unanimous vote of support by the San Diego Unified Board of Education, is included in the Desegregation Plan (Attachment 2a and 2b).

Additionally, SDUSD is implementing a strategic plan to develop full, theme-based Magnet articulation pathways in varied geographic locations throughout the district to support recruitment of students from different social, economic, ethnic, and racial backgrounds into the magnet schools. Magnet articulation pathways are designed to both attract the rich diversity that often resides within school boundaries back to the site, and attract nonresident students wishing to take advantage of the subject area emphasis and specialized course offerings generally not available at other schools. All SDUSD's Magnet programs are total school programs, ensuring full participation of all students enrolled. Currently, SDUSD has Magnet continuity pathways in Communications and Community Leadership; Creative, Visual, and Performing Arts; International Baccalaureate and Global Citizenship; Language Enrichment and Immersion; and STEM/STEAM, each in a portion of the district.

The proposed MSAP STEAM pathway will reside in the Linda Vista community within the District's centrally-located Kearny Cluster, which is approximately 20 minutes from the U.S. Mexico International Border. Rich in history, the community of Linda Vista was created in 1940 in response to a desperate need for housing. With the onset of World War II, over 1,500 people per week started arriving in San Diego, answering the call for defense workers. This influx overwhelmed the city's available housing as the

population grew from 203,341 in 1940 to 334,387 by 1950. The first wave of incoming workers and their families slept in cars or in federally supplied trailers in Mission Valley. After an appeal to the government for support, the Lanham Defense Housing Act of 1940 jump-started the largest low-cost defense housing development at the time. The selected location was atop an olive grove, among beautiful canyons and hillsides with a clear view to the Pacific Ocean. The housing project, which at one point boasted 3,000 homes, was named Linda Vista, meaning "beautiful view" in Spanish. The Linda Vista project eventually built 5,200 dwellings, many of which still exist today. The large numbers of children easily overwhelmed available schooling facilities. School was held outside, or in some of the newly built houses, until the three proposed grant sites were constructed. With new arrivals soon overwhelming these three sites, San Diego became the first district in the nation to design and build portable classrooms.

At the war's end, large numbers of defense workers stayed, purchasing their Linda Vista homes. Since the late 1970's, Linda Vista has drawn immigrants from Southeast Asia seeking asylum from difficult political situations in their home countries. Linda Vista is now one of the lowest-income and most diverse areas in San Diego, with over 21 languages spoken. However, this diversity is not fully reflected in the student body at the three proposed magnet sites, which all experience minority group isolation (MGI) of Hispanic students. SDUSD defines a site as experiencing MGI when the proportion of students in one racial or ethnic group enrolled at the site exceeds the district-wide proportion of students in that racial or ethnic group in the same school level by 15 percentage points or more.

Kit Carson Elementary School was the first elementary school in the area, built in 1941. Carson, one of the few original two-story elementary schools in SDUSD, currently serves 462 students grades K-5th, with 30 teachers. Almost all (96.6%) of the students are eligible for free and reduced price lunch. In Spring 2015, just over one third of Carson's students (37%) in grades 3-5 met or exceeded CCSS standards in Language Arts, compared to 50% district wide, and 35% met or exceeded CCSS standards in mathematics, compared to 41% district wide. Just under half (44.4%) of 5th graders scored proficient or above in science, as compared to 65% district wide. Over two thirds of the students (67.1%) are English Language Learners.

Currently, 53% of families living within the boundaries of Carson choice out of the school. Through the magnet, Carson will create 82 seats, bringing enrollment to 544 students by the end of the project. Carson's diversity goal will be to reduce MGI of Hispanic children, which stands at 62.8% compared to the district average of 44.7%.

Linda Vista Elementary was built in 1943 as the numbers of defense workers and families continued to grow. Linda Vista Elementary currently serves 433 students, with 27 teachers, in grades K-5, with 93.8% receiving free/reduced lunch. Student enrollment includes 78.7% English Language Learners.

Linda Vista faces significant challenges in terms of student achievement. Only about one fifth of the students (21%) in grades 3-5 met or exceeded CCSS standards in Language Arts compared to 50% districtwide, and 21% met or exceeded CCSS standards mathematics, as compared to 41% district wide. A slightly higher percentage (29.6%) scored proficient or better in science, as compared to 65% district wide. Through the magnet, an additional 110 seats will be created to bring enrollment to 543

Linda Vista's diversity goal will focus on reducing minority group isolation of Hispanic children, which stands at 76.2% compared to the district average of 44.7%.

Montgomery Middle School is named after John J. Montgomery, a San Diego aviator who made the first-ever controlled flight on a glider in the United States. Montgomery was also built in 1941-42 in response to the first wave of incoming defense workers and their families, and originally housed the area's high school. The site boasts an impressive multi-story architectural design. Montgomery currently serves 439 students in grades 6-8, with 19 teachers. The students are 34% are English Language Learners and 93.8% are receiving free/reduced lunch. As of Spring 2015, 34% of students in grades 6th-8th met or exceeded CCSS standards in Language Arts, compared to 50% district wide; 23% met or exceeded CCSS standards in mathematics, compared to 41% district wide; and 51.3% of students scored proficient or better in science, compared to 65% district wide. Students enrollment includes 34% English Language Learners.

Montgomery's diversity goal will be to reduce MGI of Hispanic children, which stands at 64.5% compared to the district average of 44.7%, and is projected to increase as students from Carson and Linda Vista matriculate. An additional 99 seats will be created to bring enrollment to 538 students.

Resident enrollment percentages at all three proposed STEAM Magnets are low, as the sites have fallen out of favor with much of the community population. Resident families are opting for other district sites, particularly those on the east side of the cluster which has a slighter higher socio-economic rate, and a range of charter schools and private schools, as shown in Table 2 below:

Table 2. Resident Families Choicing Away From Proposed Grant Sites				
Site	**Seating capacity**	**Actual enrollment**	**# of students attending other district sites**	**# of students attending charter schools**
Carson	632	462	374	101
Linda Vista	604	433	313	80
Montgomery	639	439	537	152

Data Source: *SDUSD Data and Reporting Department*

As shown in Table 3 below, the increasing numbers of families choicing away from Carson, Linda Vista, and Montgomery has created high levels of Hispanic student isolation at each proposed magnet school.

Table 3. Hispanic Student Isolation at Grant Sites							
	American Indian/ Alaskan native	Asian	Black or African American	Hispanic/ Latino	Native Hawaiian or other Pacific Islander	White	Two or more races
District diversity profile K-5	0.3%	10.6%	9.1%	**46.8%**	0.5%	23.9%	8.8%

Table 3. Hispanic Student Isolation at Grant Sites							
	American Indian/ Alaskan native	Asian	Black or African American	Hispanic/ Latino	Native Hawaiian or other Pacific Islander	White	Two or more races
Carson	0.0%	20.1%	4.8%	**62.8%**	0.2%	5.8%	6.3%
Linda Vista	0.2%	12.7%	5.1%	**76.2%**	0.7%	2.1%	3.0%
District diversity profile Grade 6-7	0.1%	15.9%	7.1%	**41.7%**	0.5%	26.1%	8.5%
Mont-gomery	0.0%	17.8%	7.5%	**64.5%**	0.9%	4.3%	5.0%

Data Source: *SDUSD Data and Reporting Department*

Efforts to draw back the resident population for each site will support the goal of reducing Hispanic minority group isolation, as the population of school-age children ages 5-14 for each site has greater diversity than is reflected in the current enrollment (see Table 4).

Table 4. Diversity in School Age Population within the Boundaries Of the Proposed Grant Sites						
	Carson		**Linda Vista**		**Montgomery**	
	% Total	% Below Poverty	% Total	% Below Poverty	% Total	% Below Poverty
Race Total N	1,925	48%	1,039	45%	4,269	36%
White Alone	46%	52%	51%	50%	52%	35%
Black or other African American alone	8%	89%	7%	93%	8%	63%
American Indian and Alaska Native Alone	1%	67%	4%	0%	1%	16%
Asian Alone	18%	47%	25%	19%	20%	36%
Some Other Race Alone	10%	76%	10%	78%	8%	68%
Two or More Races	17%	4%	3%	5%	11%	3%
Ethnicity						
Hispanic or Latino	50%	37%	62%	53%	46%	46%

Data source: *U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimate*

The large numbers of students choicing away has also created socio-economic isolation. The district average for free and reduced meal eligibility is 59.4%. As noted above, meal eligibility percentages for the proposed Magnet sites range from a low of

92% at Montgomery to a high of 96.6% at Carson. As described in the narrative response to the Invitational Priority, SDUSD will utilize a systemic approach beyond recruitment through its weighted lottery process to draw added racial-ethnic diversity and to increase the socio-economic diversity.

The development of the STEAM pathway will offer an opportunity to not only reestablish these schools within the community and beyond, but to reconnect the schools, the community, and the greater San Diego area with Linda Vista's historic past. Few in San Diego realize the origin of this quiet community, and its importance in the development of San Diego. Efforts will be made to add to the rich ecosystem of partnerships already under development by reaching out to the area's defense and aviation industry to develop partnerships that honor the history and support prospects for the future.

The development of three new STEAM Magnet sites to create a STEAM pathway is also responsive to voiced preference of families. Prior to the start of the 2014-15 school year, the then newly-appointed Area Superintendent met with families and community members to discuss the needs of the Linda Vista schools and community. Surveys showed an overwhelming desire for a STEM/STEAM emphasis. All three administrators in the schools were then hired with this preference in mind. All three have experience in STEM/STEAM schools, and a background compatible with the focus. The large number of parent, community, and partnership letters and signed endorsements, found in Attachment 6, are testament to the excitement about the potential to develop the STEAM pathway.

STEM/STEAM is a preferred focus for families and the greater San Diego area as

well, as San Diego area developed as a hub of the STEM/STEAM industry. During the next five years, the demand for STEM workforce is projected to grow dramatically, with demand in California projected to increase 19% by 2018 (San Diego Science Alliance, 2016). The U.S. News STEM Solutions National Leadership Conference was held June 1, 2015 in San Diego. The conference brought together more than 1,500 stakeholders from all sectors of the national STEM community to address the shortage of skilled workers to fill STEM jobs all over the country. Lt. Commander Alvara, speaking at the conference, emphasized two key actions critical to addressing this projected shortage—motivate students in the early elementary years to consider STEM jobs and provide engaging, hands-on learning experiences so students come to understand the real-life applications of STEM learning. Employers agree that the workforce of tomorrow will need a deep knowledge of computer science, IT, big data, math, and other STEM-related abilities, not just for science and tech jobs, but for all occupations. Such skills are essential for San Diego's booming biotech and life sciences industry (ranked third largest in the country), as well as other large employers in IT, manufacturing, and health care. San Diego industries are already feeling the need. In 2014, San Diego County businesses filed roughly 4,800 H1B visas, according to the San Diego Regional Economic Development Corporation, as they were not able to find qualified US citizens to fill positions.

This combination of the STEAM theme and a weighted lottery system has proven effective in SDUSD. Valencia Park, located in the south-east quadrant of San Diego, transitioned into a STEAM Magnet in 2013. Recruitment through the weighted lottery system has resulted in an increase in enrollment of 53 students, and a reduction in

minority group isolation exceeding goals by 1.38 percentage points. The Linda Vista community has requested the same reinvestment in schools in their portion of the district. This development of the full STEAM Magnet pathway is an important step in SDUSD's strategic plan to continue progress towards its diversity goals. Developing a K-12 STEAM pathway in the Linda Vista portion of the Kearny cluster will offer a diverse student population a similar opportunity to immerse in a STEAM education, learning with and from diverse others, from kindergarten through high school. This opportunity will increase the likelihood of a STEAM-related education beyond high school and future STEAM-related employment.

SDUSD's Choice/Magnet Process

In SDUSD, applications for Magnet schools are accepted from students district-wide, city-wide, and county-wide between November 1 and February 15 of each school year. The Neighborhood Schools and Enrollment Options Office, in collaboration with the Office of School Innovation, which supports the District's Magnet program, publishes an Enrollment Guide highlighting the District's Magnet options. The Guide is available in English and Spanish, with added translation support available through the Neighborhood Schools and Enrollment Options Office and the District's Translation Office, inclusive of Spanish, Vietnamese, and Tagalog. The Enrollment Guide is published online, and available in booklet form at school sites and as handouts and enrollment fairs; a copy is mailed to all district families.

Families may apply online, or in person through the Neighborhood Schools and Enrollment Options Office. As part of the District's continued support for family choice and diversity goals, the Neighborhood Schools and Enrollment Options Office has been

redesigned as a welcome center, with the intent of personalized service in helping each family select a school that meets their needs. Certificated teachers and counselors are now a part of the Enrollment Options staff. These individuals contact the District's Magnet schools and arrange meetings and tours to ensure their own knowledge of each opportunity, to better serve families in making the strongest Magnet choice for their student(s).

To ensure an effective process to recruit students from different socio-economic, ethnic, and racial backgrounds into the magnet schools, SDUSD utilizes an intra-district weighted lottery system, as explained in the Invitational Priority for Socio-economic Integration section of this application. Every three years, SDUSD engages in a process to sort the district's high school clusters, the main organizational structure for all schools in the district, into three groups based on socio-economic status derived from free and reduced meal eligibility. Using fourth-week enrollment data, all students are matched to their home high school (regardless of school of enrollment) through the Geographic Information System. A list of all students residing within each high school's boundaries is then sent to Data and Reporting. Names for each student residing inside a high school boundary are matched to free or reduced meal eligibility, creating a percentage of meal eligibility for students residing in each high school boundary, as opposed to the percentage for students actually enrolled in the site.

A report is created indicating the percentage of resident students that are free or reduced meal eligible in each high school cluster. Using these data, the high schools are sorted into three groups, creating three socio-economic application groupings. Currently, the three groups are:

- Group 1: High schools with 0%-33% of resident students (regardless of school of enrollment) who are free or reduced meal eligible
- Group 2: High schools with 34%-66% of resident students (regardless of school of enrollment) who are free or reduced meal eligible
- Group 3: High schools with 67%-100% of resident students (regardless of school of enrollment) who are free or reduced meal eligible

Once received, all Magnet applications are sorted into one of the three groups using the student's home address/high school of residence. Each magnet site then has a weighted preference for applications from groups other than the group its own resident population is sorted into. For example, if a magnet is located in group one, applications from groups three and two are given preference. This is done through a computerized process, with the end goal of developing an application list for available seating that is most likely to contain the socio-economic as well as racial-ethnic diversity each site needs to fulfill its diversity goals.

Once applications are sorted by the weighted lottery process, each is assigned a computer-generated random number within its priority category. In April of each school year, rank-order lists are computer-generated using the random numbers inside each academic/socio-economic grouping, and lists are provided electronically to each Magnet school. Families are then contacted by list order directly by the Magnet school and offered enrollment for the following school year. Students who have made a commitment to a Magnet theme are given top priority to continue in that Magnet theme

when articulating to the next level (from elementary to middle to high school), ensuring continued socio-economic diversity.

To support efforts to draw a diverse applicant pool into the weighted lottery, the Office of School Innovations employs a full-time Marketing and Arts Resource Teacher, who works with Magnet schools to image, brand, and market.

The three proposed Magnet sites will be a choice option for residents, district families outside the resident boundaries, and families outside the school district. All three are located in the northwest corner of the intersection of two major freeway systems in central San Diego, just a few short miles from Mission Valley, a major business and tourist corridor. Businesses in the area include upscale retail, hotels, recreational, and large office buildings with varied professional occupants. This thriving business corridor offers opportunity to market to working parents looking for school options close to their employment.

To ensure the diverse range of families are aware of the opportunity to attend a STEAM Magnet, the Marketing and Arts Specialist will support the sites in developing a multi-year marketing plan. This marketing plan, specific to each site, will be based on the STEAM vision and mission statement; the development of branding and imaging aimed at a target audience; the development of marketing materials; and opportunities to network with immediate community and the greater San Diego community and on the rich potential partnerships to support that networking. The Marketing/Arts Specialist will work with site leadership teams to build their expertise, and support them as they develop parent and teacher collaboration and expertise for sustainability purposes. A

sample of the planning document that supports the development of the marketing plan is included in Attachment 8.

A key component of the MSAP marketing effort will be the development of an annual STEAM fair, developed with support from University of San Diego, a local university pledging full support through and beyond the grant, and 3Rs Robotics, which will be open to resident families, district families, and the greater San Diego community. This annual fair will offer opportunity not only for families to immerse in STEAM-related activities, but also to learn more about the academic offerings of the three sites and the Kearny High Magnet Complex, STEAM-related higher educational opportunities, and STEAM higher education and employment options. 3Rs will mentor sites in the planning and implementation of the marketing fair, ensuring a team is in place and prepared to continue the annual event by the close of the grant.

Finally, 3Rs, Biocom, and other partners will support the three MSAP sites in participation in San Diego STEAM events such as the STEAM Maker Fest at the San Diego County Fair Grounds and the STEAM Expo in Petco Park. These events attract families from the greater San Diego area, providing active, collaborative marketing opportunities.

(2) How it will **foster interaction** among students of different social, economic, ethnic, and racial backgrounds in classroom activities, extracurricular activities, or other activities in the magnet schools (or, if appropriate, in the schools in which the magnet school programs operate). (34 CFR 280.31)

SDUSD realizes that developing Magnet sites with richly diverse populations is only the first step in developing a value for the potential of learning with and from diverse others. Indeed, the vision of the Office of School Innovation, which oversees Magnet programs and implementation of the MSAP grant is: *To build communities where students value learning with and from diverse others to become engaged, flexible and innovative global citizens.*

To foster interaction among students of different social, economic, ethnic, and racial backgrounds in classroom activities, extracurricular activities, or other activities in the magnet schools, MSAP site leadership, classroom teachers, and STEAM-RTs will be supported in curricular design and the accompanying pedagogical shifts that engage students in collaborative learning experiences that truly create environments where students come to *value learning with and from diverse others.*

The range of experiences brought to school by culturally, linguistically, and ethnically diverse students offer a powerful resource that enables all to learn more (Cole, 2008). Dr. Heather Lattimer, Chair of School of Leadership and Education Sciences (SOLES) at the University of San Diego (USD), has published research on the critical role that student interaction plays in developing empathy and perspective consciousness (Lattimer, 2009). Lattimer's analysis revealed four primary classroom conditions that support students in rethinking their views of controversial topics and understanding perspectives that are different from their own. Those conditions are: (1) Presentation of a range of evidence through classroom learning experiences, (2) Opportunity for reflection and re-thinking, (3) A safe classroom environment that supports respectful dialogue, and (4) The critical role of peer-to-peer dialogue.

At the district level, the proposed MSAP sites will be incorporating the SDUSD's Learning Cycles, a district-wide inquiry designed to engage leadership and teachers in the process of developing classroom conditions that improve student interaction as outlined by Lattimer. The district's Learning Cycle inquiry leads with the question, "*How do we develop students who take an active stance in their own learning and become actively literate, contributing members of society who make a positive difference in the world?*" All SDUSD sites engage in four cycles, or explorations, across the school year. The district-wide inquiry begins with Area Superintendents and Administrators, who meet monthly to develop a professional immersion each cycle. Administrators then lead their school site in exploration of each cycle across the course of an academic year. Each cycle is launched with its own inquiry question:

- Cycle 1: *How do we develop an academic, social, and physical environment worthy of our children?*
- Cycle 2: *How do we create classrooms that are alive with collaborative conversations?*
- Cycle 3: *How do we create the learning conditions that maximize the potential that lies within the variability of all learners?*
- Cycle 4: *How do we develop students who take an active stance in their own learning and the learning of others?*

As sites take on the work, progress is brought back to the monthly Administrator meetings. Triads of administrators from within a district cluster visit each other's school sites with the Area Superintendent to observe, reflect, and draw from successful

practice at the classroom level. The district focus on collaborative, dialogic learning (a theory of learning focused on the ability to think and talk collaboratively to construct new understandings), and the creation of student-centered environments where learners are actively engaged with ideas and with each other, strengthens the efforts of Magnet sites as each builds diversity and works to create the teaching and learning practices that will *engage students in learning with and from diverse others* throughout the school day and beyond.

At the project level, the support of the central office MSAP team, a partnership with World Savvy, and the development of an Early Learner Collaborative (ELC) will engage teachers in a collaborative, classroom-focused, inquiry-driven research process that will enhance teaching methods. Emphasis will be placed on increasing interaction among students of different backgrounds through the development of dialogic learning environments that move students from tolerance of differences to truly respecting, valuing, and learning from those differences and differing perspectives.

Maria Nichols, the Director of School Innovations and the proposed full-time Magnet Project Director, has published widely and worked nationally supporting districts and teachers with the development of dialogic learning environments. She will work with leadership and teachers to support the development of learning environments where students from varied backgrounds work interactively. Dialogic learning communities have been shown to improve academic achievement in science, math, and English and to decrease differences across race, socioeconomic status, class, and gender (e.g., Mercer, Dawes, & Staarman, 2009; Nystrand, 2006; Nystrand, Gamoran, Kachur, & Prendergast, 1997; Webb et al., 2014). Teachers will be supported in creating learning

environments that support respectful dialogue, and in creating units that incorporate varied sources from diverse authors, offering students opportunity to engage in wider ranges of perspective as they construct understanding and form their own opinions. By attending to STEAM education in an engaging dialogic manner, their approach will have the side benefit of developing children's sense of well-being and school engagement, which act as a protection against a broad range of risk factors encountered by children in poverty (e.g., Ryzin, 2011).

The ELC will support primary-level teachers in developing student-centered classrooms that enable the development of inquiry and student agency in our youngest STEAM learners. The ELC will be supported by Dr. Peter Johnston, Professor Emeritus from the State University New York, Albany, researcher, and author of Opening minds: Using language to change lives (2012), and Choice words: How our language affects children's learning (2004). Through PLCs and classroom inquiry, Dr. Johnston will support site leadership, STEAM-RTs, and classroom teachers in investigations of the consequences of teaching decisions, particularly language choices, for the kinds of learning behaviors children acquire, the ways teachers and students build productive learning communities, and the implications of focusing on engagement. Emphasis will be on student inquiry processes, as teaching STEAM content requires an open-ended inquiry approach (Marshall & Horton, 2011). The inquiry approach to instruction, so vital to STEAM learning, supports diversity goals as well. With inquiry instruction, students with diverse backgrounds and abilities will have shared experiences as a basis for their ideas, making learning accessible to all students because the explorations are made and experienced by all students (Marshall & Horton, 2009).

Partnership with USD's Mulvaney Center for Community, Awareness, and Social Action will focus on designing a STEAM curriculum with social action at the core. Engagement in social action will invite cross-class, cross-grade, and cross-site interactions, ensuring students are constantly working in diverse collaborations. The Mulvaney Center is committed to creating an ecosystem of positive social change in the Linda Vista Community, where our three proposed MSAP sites are located. The Mulvaney Center's orchestrates the efforts of professors and USD's student interns through the Bayside Community Center, a non-profit, neighborhood-based organization located adjacent to the Carson campus. Through Bayside, the Mulvaney Center is able to link learning and outreach to the wisdom of the community, collaborating with residents in developing meaningful change.

Described in depth in the Quality of Project Design section, engagement in the developing STEAM curriculum will create student-centered, active teaching and learning environments where all students work collaboratively in shared problem-seeing, and problem solving explorations. STEAM instruction and curricular units will be developed with a foundation of constructivist theory that will guide the development of inquiry-based, problem-based STEAM curriculum. Dialogic theory will support teachers in developing facilitation practices that ensure all voices are heard, all perspectives considered, and in fact are used to construct unique and innovative understandings and solutions to problems.

Unit design will also invite the participation of community and partnerships, increasing the range of voices and perspectives included in inquiry processes, and furthering *the building of communities where students value learning with and from*

diverse others to become engaged, flexible, and innovative global citizens. For example, students at varied grade levels may design units to explore varied issues with water, a critical area of study in drought-ridden southern California. Issues may range from access to clean water, disruptions in the water cycle, the economics of water, water pollution, the pros and cons of desalinization, etc. Students may study these issues on a global perspective, then investigate to determine whether these issues touch their community, and to what degree. Students may share research and questions site-wide, and with students from the other STEAM sites through social media. As they reach into their community, they are able to draw community members into the problem-seeing process, and engage them in problem solving. From simple solutions such as the design of dew catchers to solve watering issues in a garden, to more complex solutions such as the design of a rain barrel project, communities are able to work together to problem solve a global issue at a local level.

SDUSD will also work with partnerships such as 3Rs Robotics, TreObytes, Art Reach, and Good Neighbor Gardens to design extended learning opportunities at each site. These opportunities will be in the form of clubs offered at varied times of the day and varied days of the week, and opportunity for during-the-school-day participation. Teachers and community volunteers will work with consultant experts to learn and prepare for sustained club options beyond the life of the grant. Beyond providing more engaging outlets for STEAM education, all of these extended learning opportunities will take deliberate steps to increase interaction of families

and students from diverse genders, backgrounds, and cultures by designing engaging activities with wide appeal across genders and cultures.

(3) How it will ensure equal access and treatment for eligible project participants who have been **traditionally underrepresented** in courses or activities offered as part of the magnet school, *e.g.,* women and girls in mathematics, science, or technology courses, and disabled students. (34 CFR 280.31)

SDUSD takes seriously issues of equal access and treatment for all students. Currently, the district is working with The National Equity Project to develop excellence through equity for students of all cultures inclusive of sexual orientation, religion, socio-economic status, disability/ability, gender, age, and race/ethnicity. The National Equity Project defines equity as follows: *"Equity means that each child receives what he or she needs to develop to his or her full academic and social potential."* The goal of this work is to support district and site leaders to employ an equity framework, illustrated in Figure 1 below, to support efforts to work effectively and inclusively with all cultures within a learning environment.

Figure 1. Excellence Through Equity

Data Source: The *National Equity Project*

Leadership at each MSAP site, along with key teachers, has started attending district professional development led by consultants from the National Equity Project. Understandings constructed through this work will be incorporated into adult collaborations as teachers, families, and other key stakeholders work together, and will be incorporated into the design of student collaboration inside STEAM units.

A 2015 report released by the National Science Foundation entitled *Women, Minorities, and Persons with Disabilities in Science and Engineering* presented research showing that women, persons with disabilities, and three racial/ethnic groups—African Americans, Hispanics, and American Indians—are considered underrepresented in

science and engineering. Additionally, *Monitoring Progress Toward Successful K-12 Stem Education: A Nation Advancing?*, a 2013 report by the Committee on the Evaluation Framework for Successful K-12 STEM Education, described three goals for U.S. K-12 education in the STEM disciplines. The first of these goals fully focuses on broadening the participation of women and minorities in those fields.

Eccles (2007) has shown that women and ethnic minorities lose interest and self-confidence in science and math subjects for reasons having more to do with misconceptions and stereotypes than with science or math ability. Additionally, research shows that early socialization and achievement experiences of females and ethnic minorities can have a substantial impact, positive or negative, on students' decisions to pursue and persist in careers in science and math throughout the STEM pipeline (Valla & Williams, 2012). The effects of stereotype threat on performance can be reversed by simply exposing the at-risk population to positive STEM-relevant role models, or by conveyed messages of positive ability to students in the classroom (Dweck, 2007; McIntyre et al., 1995).

Many girls come to elementary school with little or no experience with "tinkering." Girls may also have received spoken and unspoken messages about STEM-related activities indicating that math, science, and similar fields are not for girls, or are "too hard" for girls. These gender differences often have their root in elementary years as well, where traditional instructional methods and gender stereotypes keep girls from active involvement in STEM-related instruction. The design of a STEAM articulation pathway beginning in Kindergarten is a deliberate move to develop in all students a belief in his or her ability to be successful in STEAM endeavors. When our youngest

learners immerse in the STEAM disciplines in joyful, supportive learning environments, negative attitudes are less likely to develop. In support of all underrepresented groups in STEAM-related work and learning, SDUSD's STEAM magnets will provide early, positive STEAM experiences which instill and maintain interest and self-confidence combined with a "Who's Who in STEAM" curricular component, a focus on successful individuals representing a range of race, ethnicity, and gender in STEAM endeavors.

The staffs from all three proposed sites are committed to developing STEAM teaching and learning as a total school program fully integrated into the instructional day and beyond for all students. Designing STEAM units that are relevant to students' lives by integrating community need through the support of USD's Mulvaney Center for Community, Awareness and Social Action will do away with any propensity towards gender-biased STEAM activities that might dissuade older students. Should added support be needed, the District has a Title IX Office staffed by a Title IX coordinator, who supports the district and sites in ensuring gender equity in all programs.

The proposed middle school Magnet currently offers *Mathematics, Engineering, Science, and Achievement* (MESA) to its 6th graders, and *Gateway to Technology*, the middle school stage of *Project Lead the Way* (PLTW), to its 7th and 8th graders. MESA targets students traditionally underrepresented in STEM fields, providing a unique combination of enrichment activities, hands-on competitions, academic support, industry involvement, and a supportive community environment. PLTW is a nonprofit organization that provides transformative learning experiences for K-12 students through pathways in computer science, engineering, and biomedical science. PLTW

emphasizes problem-solving strategies, critical and creative thinking, and processes for communicating and collaborating.

Currently, participation in both MESA and *Gateway to Technology* is not as broad or robust as it should be. MESA is serving approximately 30 6th graders, while *Gateway to Technology* currently serves approximately 120 7th and 8th graders. SDUSD will employ specific strategies to expand participation in these opportunities and all extended learning opportunities, both in increasing the numbers of students, and working to ensure balance in gender and inclusiveness for students with disabilities. Strategies will include options such as developing *Launch*, PLTW's elementary program, as an integrated component in the elementary curricular design and as an extended learning opportunity, creating diverse student interest within the STEAM pathway. Additionally, the middle school will work to better recruit diverse students for participation in MESA and *Gateway to Technology* by bringing in diverse mentors through their business and higher education partners.

As an added effort to support populations that tend to be underrepresented in STEAM learning and employment, SDUSD will work to bring on board diverse partners, consultants, and volunteers to serve as mentors and models of possibility. TreObytes will be working with all three proposed grant sites. TreObytes was developed by an African American female engineer who saw the lack of diversity in her work environment as a call to action. She developed TreObytes specifically to support students in developing a love for engineering and an understanding of the engineering design process in lower socio-economic, diverse schools. Her Board of Directors is formed by

middle school students (some from Roosevelt Middle School IB STEAM Magnet in SDUSD) with an equal numbers of female and male members.

Through the support of these consultants and local business consortiums such as Biocom, teachers and students will have access to guest speakers from STEM industries, high school students heavily involved in STEM-related studies to serve as mentors, student interns from USD, and STEAM-related competitions to motivate and excite. Efforts will be made to ensure wide representation in gender, race, and ethnicity in these mentors and opportunities.

The districts ADA/504 Department will fully support the needs of students with disabilities if needed to ensure participation opportunities. The district's Special Education policy is predicated on a belief of placing students in the least restrictive environment, and providing supports and services within that environment. Special Education staff are available to join planning sessions to ensure curricular design meets a range of needs. Adaptive technology support, if needed, is available through Occupational and Physical Therapy Services Department within the Special Education Department. As sites develop Maker Spaces, for example, they will work with the Special Education and the Ed Tech departments to ensure that adaptive technology options needed for students with disabilities are part of the design.

(4) The effectiveness of all other desegregation strategies proposed by the applicant for the elimination, reduction, or prevention of minority group isolation in elementary schools and secondary schools with substantial proportions of minority students. (Section 5301(b)(1) of the ESEA)

SDUSD takes a systematic approach towards the elimination, reduction, or prevention of minority group isolation in its elementary schools and secondary schools. In addition to the strategies described above to support the reduction of minority group isolation—both in existing SDUSD and proposed magnet schools, the District employs the following strategies to promote the reduction of minority group isolation in its elementary and secondary schools.

GATE Identification

In 2014-15, SDUSD focused on reassessment and revision of its process for identification and placement in Gifted and Talented Education (GATE). This process was spearheaded by the District's GATE Advisory Committee, comprised of family and community representatives, in collaboration with SDUSD's GATE Department, the Chief of Staff, and the Superintendent.

Beginning with the 2015-16 school year, the GATE department now utilizes a multiple eligibility matrix for identification of GATE seminar and GATE cluster students. A key element in GATE identification is universal testing at Grade 2 using the Cognitive Abilities Test (CogAT). The multi-criterion matrix includes an ability test, achievement data, teacher/parent rating scales, and additional factors (English Language Learners, IEP/504 students, and Free/Reduced lunch status). The CogAT is considered a culturally fair test with a non-verbal component to eliminate a heavy verbal demand when assessing abilities. The non-verbal component does not require reading, assesses general mental ability, and is not based on achievement. In addition to universal testing, multiple criteria including teacher rating, parent rating, economic status, special education needs, second language needs and students who have had to

relocate multiple times due to homelessness or foster care are considered in the identification process. An appeal process is in place to evaluate placement decisions for students who may not currently fit into either GATE Cluster or GATE Seminar programs. SDUSD expects that sites with GATE programs will start to see improved diversification as newly identified GATE students enroll. Data will be tracked to test progress towards this expectation.

Off-Campus Integrated Learning Experiences (OCILE)

The District's Race Human Relations and Advocacy department has established the Heritage Program, a one-day opportunity for 4th graders to visit the Old Town and Mission Trails Park, located adjacent to San Diego's Historic Old Town District. The Heritage Program brings together 4th graders from across the district, strategically pairing sites with varied racial/ethnic and socio-economic compositions. Students work across-sites, engaging in lessons and taking walking excursions to the historic sites. The Heritage Programs is made possible through community-sponsored grants, and incorporates the Race Human Relations and Advocacy department's student leadership curriculum.

Redesign of the Neighborhood Schools and Enrollment Options (NSEO) Office

SDUSD's Neighborhood Schools and the Enrollment Options office has been moved and redesigned to more efficiently and personally serve parents seeking Choice options inclusive of enrollment in Magnet schools. The Director of NSEO is fully versed in the District's diversification efforts as well as the specific goals of each Magnet site. She travels to attend community group meetings, military enrollment fairs, and meetings of parents planning for their student's articulation to the next level to discuss Choice

options inclusive of Magnet programs. The NSEO office is now staffed to better serve parents by phone or in person, with certificated teachers and counselors who have toured the Magnet sites, and met with staff to understand their unique programs.

The District's NESO supports families desiring choice options beyond Magnet Schools as well. Families are welcome to use the application process for any school in the district. Enrollment is offered through a random lottery process as long as seats are available.

VEEP

SDUSD also offers a voluntary Enrollment Exchange Program (VEEP). Through VEEP, students may choose to attend an allied school other than the geographic school of residence. Although student racial/ethnic background has not been used as criterion for admission since 1999, students enrolling at a VEEP site are generally of an underrepresented racial/ethnic and/or socio-economic group at the receiving school. Student recruitment activities for the VEEP program include letters and presentations to parents providing information about the program and the enrollment procedures. Applications submitted to attend a VEEP school between November 1 and February 15 are randomized and receive priority over applications submitted after February 15.

Organization of Magnets into Academic Pathways

SDUSD's strategic plan to develop full articulation pathways for its Magnet programs is a key strategy for the elimination, reduction, or prevention of minority group isolation in elementary schools and secondary schools with substantial proportions of minority students. The intent of the pathways is not only to develop strong programs

that attract a diverse population, but to create a disciplinary and pedagogical focus for teachers K-12 so that professional development is fully focused on teaching and learning goals that strengthen instruction and student achievement within the theme. Too, financial resources, partnerships, family and community involvement, and marketing and recruitment efforts are aligned to the Magnet articulation theme, ensuring breadth and depth of support. Families are offered continuity preference across the K-12 articulation pattern, so that the efforts to attract a diverse population in the early years continues to eliminate, reduce, or prevent minority and socio-economic isolation in later years.

Program Improvement

SDUSD also builds diversity through Choice options for students in schools identified for Program Improvement (PI). Parents are offered the option to transfer their students to another district school not identified for PI through the support of the NSEO. Letters are sent to all eligible families communicating this opportunity. Low-achieving students from low-income families are to given priority for admission to a non-PI school, and transportation is provided. The program is implemented in secondary schools within established allied school patterns that promote student integration.

(b) Quality of Project Design (35 points)

(1) The manner and extent to which the magnet school program **will improve student academic achievement for all students** attending each magnet school program, including the manner and extent to which each magnet school program will

increase student academic achievement in the instructional area or areas offered by the school. (Sections 5305(b)(1)(B) and 5305(b)(1)(D)(i) of the ESEA)

To prepare our students for the competitive global economy they will face in the years ahead, the San Diego Unified Board of Education has developed a focused, long-term plan, known as *Vision 2020,* to improve student academic achievement for all students. *Vision 2020* is a community-based school reform plan that engages all parents, staff, students, and community members. Through the process of developing Vision 2020, 12 key indicators emerged and have become the focus of systematic efforts throughout the district:

- Access to a broad and challenging curriculum
- Quality teaching
- Quality leadership
- Professional learning for all staff
- Closing the achievement gap with high expectations for all
- Parent/community engagement around student achievement
- Quality support staff integrated and focused on student achievement
- Supportive environment that values diversity in the service of students
- High enrollment of neighborhood students
- Digital literacy
- Neighborhood center with services depending on neighborhood needs
- Safe and well-maintained facilities

Efforts to increase student academic achievement at the three proposed Magnet sites will work in concert with all district efforts aligned to these key indicators. Monthly administrator meetings offer opportunity for administrators across the district to collaborate and share best practice focused on the quality indicators. Administrators at the three proposed MSAP sites will use this opportunity to collaborate, incorporate district efforts into their ongoing work, and disseminate their progress with innovative curricular design aimed at building the collaborative, inquiry-based teaching and learning critical to a STEAM learning environment.

Teams of District Resource Teachers are in place to support these efforts. The teams include CCSS Resource Teachers in Language Arts and Mathematics, English Learner Support Resource Teachers, Educational Technology Resource Teachers, College and Career Technology Education Resource Teachers, Visual and Performing Arts Resource Teachers, and Special Education Resource Teachers. These Resource Teachers are deployed throughout the district to support progress towards CCSS.

Instructional Design Framework for SDUSD MSAP Project

SDUSD is proposing to develop STEAM teaching and learning at all three proposed MSAP sites to increase student academic achievement in science, technology, engineering, arts, and mathematics, as well as in language arts, which is critical to success in each discipline and to the process of engaging in STEAM as an interdisciplinary effort. The Central Office MSAP team defines STEAM as an interdisciplinary approach to teaching and learning, as opposed to a course, individual class, or specified time period in the instructional day. STEAM teaching and learning is an immersion in real and relevant inquiries that encompass instructional depth in

the full range of STEAM disciplines as well as embedding opportunity to develop critical habits of mind such as empathy, tenacity, flexibility, open-mindedness, and creative confidence.

While the focus of instruction is STEAM, it is the process of that instruction that is most critical because, while improving students' learning of relevant concepts, it has many synergistic side effects. There is considerable research showing the importance of engagement and the conditions that support engagement, not only for children's academic development, but also for their happiness and well-being, which further catalyze their academic growth (Guthrie, Wigfield, & You, 2012; Ivey & Johnston, 2013). In particular, research has consistently supported the tenets of self-determination theory, that children (and adults) need a sense of autonomy, belonging (or relatedness) and competence (Ryan & Deci, 2000). Providing these experiences for children increases their engagement, and improves not only their academic success, but also their social, moral, and personal lives (Assor, Kaplan, & Roth, 2002; Ivey & Johnston, 2013; King, 2015; Osterman, 2000; Su & Reeve, 2011). The majority of children in the United States do not experience these conditions at school, particularly those in high-poverty schools.

The work described in this proposal creates these conditions for students to develop into scientists, mathematicians, and artists, beginning in the elementary school. First, the teachers will focus children's attention on the processes of doing science, mathematics, and language arts. Drawing children's attention to the processes they use to solve problems helps them to develop a sense of autonomy and understand themselves as active agents in their learning. It also inures them against being defeated

and quitting when they are unsuccessful, building resilience (Kamins & Dweck, 1999). Second, children will be actively taught how to think and build knowledge together as scientists do. Research has established that thinking together is not only something that is essential in work life, and life in general, but also a practice that has broadly positive effects on children's development, in part because it fosters a sense of competence, belonging, and autonomy. Learning how to think together effectively has been shown in experiments to develop, among other competencies, children's comprehension, their reasoning ability, their conceptual understanding in science and math, and their creative thinking–all foundational for STEM/STEAM futures (Trickey & Topping, 2004).

At the same time, research has shown that thinking together is linked to the development of confidence, self-esteem, persistence, and to supportive social interactions. In part this is because the process of thinking together builds children's social imaginations–a core developmental ability. Indeed, children with stronger social imaginations have more positive social skills, have more positive and extensive social connections, stronger moral development, and better self-regulation (Baird, JA & Astington, 2004; Fahie & Symons; Watson, Nixon, Wilson, & Capage, 1999). But there is an additional benefit that arises in the context of diversity. Children who learn to think together can be helped to see how difference in perspective and experience often produces new learning, unexpected solutions, and creative possibilities (Littleton & Mercer, 2013; Mercer, Dawes, & Staarman, 2009; Mercer, Wegerif, & Dawes, 1999).

These conditions also offer children the possibility of a sense of agency–the sense that their actions are consequential. This sense of agency is both individual and collective in that they know how to build knowledge and solve problems independently

and together. These characteristics are critical not only in the context of STEM/STEAM futures, but also for students' well-being at school and later as adults. As these abilities evolve inside STEAM instruction focused on problem-seeing and problem-solving, students begin to develop what SDUSD refers to as "the STEAM mindset." Both from a disciplinary perspective and a developmental perspective, these beliefs about the development of STEAM teaching and learning rest primarily on a foundation of two complementary learning theories: constructivism and dialogic learning.

Constructivism, most often attributed to Jean Piaget, emphasizes the importance of active involvement in the construction of knowledge. The STEAM unit design process, which will be described below, will engage students in exploring issues and solving complex problems to incorporate disciplinary knowledge and processes to construct new understandings. In STEAM instruction based on constructivist theory, students will be engaged in authentic inquiry.

Research into inquiry processes, combined with a problem-based curricular design such as proposed in the STEAM units, is summarized in "Teaching for Meaningful Learning, A Review of Research on Inquiry-Based and Cooperative Learning" By Barron and Darling-Hammond (2008). Research findings from this meta-analysis show that students developed a more flexible, useful kind of mathematical knowledge that engaged them in "exploration and thought" (Boaler, 1997, p. 63); earned higher scores on content mastery, sensitivity to audience, and coherent design (Penuel, Means, & Simkins, 2000); an increase in the ability to define problems (Gallagher, Stepien, & Rosenthal, 1992); growth in their ability to support their reasoning with clear arguments (Stepien, Gallagher, & Workman, 1993); and enhanced ability to plan a project after

working on an analogous problem-based challenge (Moore, et al., 1996). Additional studies have documented positive changes for both teachers and students in motivation, attitude toward learning, and skills, including work habits, critical thinking skills, and problem-solving abilities (see Bartscher, Gould, & Nutter, 1995; Peck, Peck, Sentz, & Zasa, 1998; and Tretten & Zachariou, 1995). The inquiry approach to instruction, so vital to STEAM learning, supports diversity goals as well. With inquiry instruction, students with diverse backgrounds and abilities will have shared experiences as a basis for their ideas, making learning accessible to all students because the explorations are made and experienced by all students (Marshall & Horton, 2009).

SDUSD's STEAM instructional design will incorporate dialogic learning—a way of thinking and talking together that develops a valuing of varied perspectives. As developed by Robin Alexander in the early 2000's, dialogic learning harnesses the power of talk to stimulate and extend students' thinking and advance their learning and understanding. It helps the teacher more precisely to diagnose students' needs, frame their learning tasks, and assess their progress. Dialogic learning also empowers the student for lifelong learning and active citizenship. The talk involved in dialogic learning is distinct from the question-answer and listen-tell routines of traditional teaching. It requires:

- interactions which encourage students to think, and to think in different ways
- questions which invite much more than simple recall
- responses which are justified, followed up, and built upon rather than merely received

- feedback which informs and leads thinking forward
- contributions which are extended rather than fragmented
- exchanges which chain together into coherent and deepening lines of enquiry
- discussion and argumentation which probe and challenge rather than unquestioningly accept
- professional engagement with subject matter which liberates classroom discourse from the safe and conventional
- classroom organization, climate, and relationships which make all this possible.

SDUSDs approach to STEAM teaching and learning combines constructivist theory with attention to student inquiry and dialogic learning, acknowledging the dialectic relationship between the individual and the collective, and the strength in constructing knowledge through communicative interactions.

To improve student academic achievement for all students, the MSAP central office team will support the proposed STEAM Magnet schools in bringing these beliefs about teaching and learning to the design of STEAM curriculum in the form of interdisciplinary units. To maintain an emphasis on instructional approaches that place students in the center of inquiries, the flow of design thinking will be used to frame the construction of STEAM curricular units. These units will involve students in a collaborative process of problem-seeing, problem-solving, offering support in constructing and applying disciplinary knowledge and processes as well as productive habits of mind.

Design thinking, a human-centered approach to innovation developed by IDEO,

an award-winning design firm, is an intentional process to get to new, relevant solutions that create positive impact. When students are embedded in design thinking processes, they work collaboratively to employ disciplinary knowledge and processes as they learn to act upon their world in thoughtful, productive ways. Our design of STEAM curricular units will follow the flow of design thinking (see Figure 2 below). Units are launched with a mix of traditional texts, visual texts, artifacts, and hands-on explorations that inspire, confound, prompt questions, and kick-start student inquiry. Science instruction builds foundational understanding of principles at play, as science process opens the door to further questioning. Students look for local connections to global issues and problems, imagine solutions, employ engineering processes, and apply mathematics to design solutions. Literacy instruction authentically supports inquiry as students research and work towards communicating understanding. The arts play a role throughout the process, serving as a means of taking meaning in from the world and sending meaning back out, as a tool for thinking; as the aesthetic component in design, and as an added mode for supporting the construction of understanding. The entire process threads empathy throughout, further developing the ability of students to understand and learn with and from diverse others. Through interdisciplinary units incorporating design thinking, students learn to look at the world around them, notice and ask, identify needs, and bring a mix of disciplinary knowledge and processes, empathy, and critical habits of mind, to collaborations focused on meeting a need.

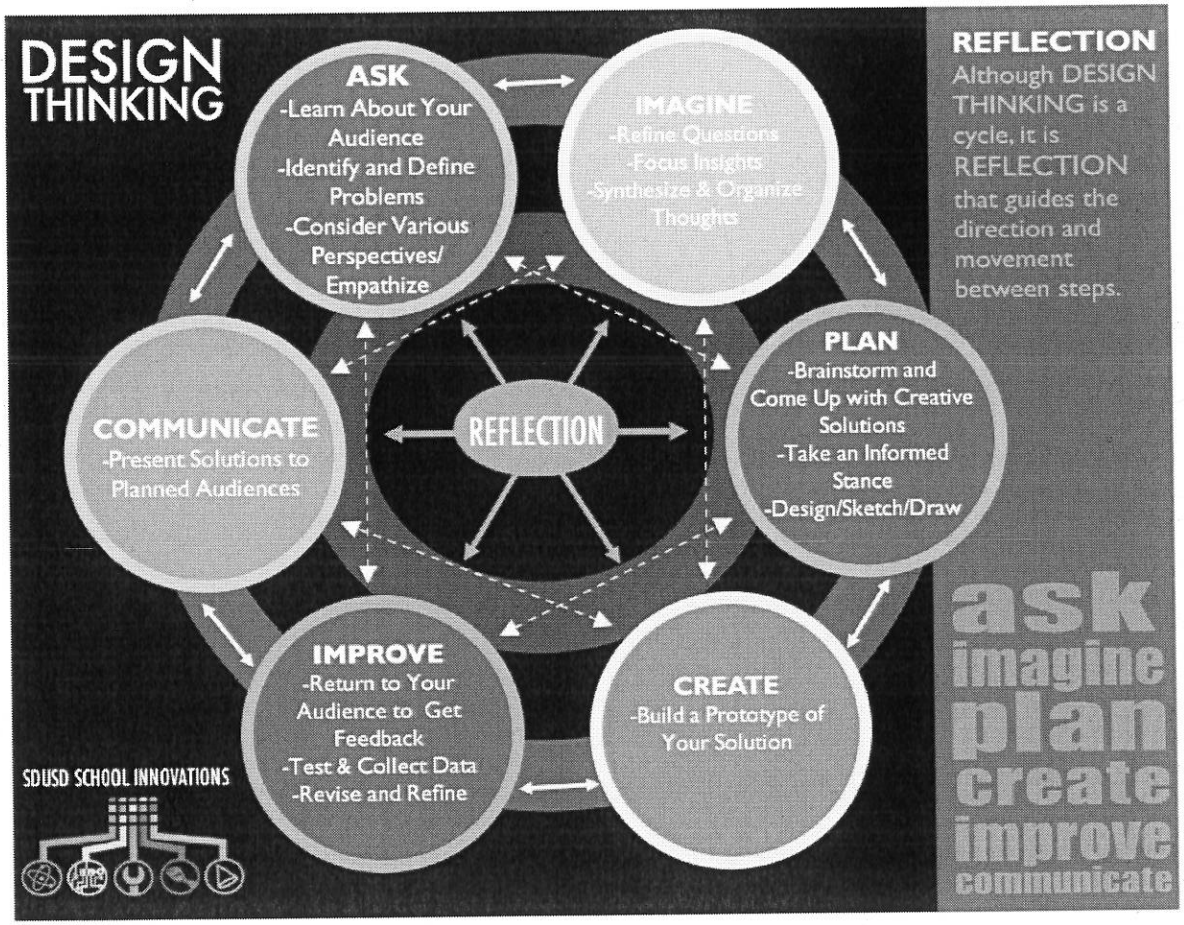

Figure 2. Design Thinking Process

Graphic Source: *SDUSD Office of School Innovations*

The problem-solving process inherent in design thinking involves the ability to synthesize knowledge from a variety of sources (Cross, 2007; Pink, 2006; Simon, 1996), which supports the demand of interdisciplinary instruction incorporating varied perspectives. Applying design thinking to problems has been shown to be a powerful driver for complex learning (Kangus, Seitamaa-Hakkarainen, & Hakkarainen, 2013). Indeed, the STEAM unit design process is in line with research findings showing superior performance for middle school students in terms of knowledge gain and achievements in core science concepts, high levels of engagement, and improved

retention when compared to a scripted inquiry approach (Mehalik, Doppelt, & Schun, 2008). Design-based learning for science has shown positive impact with elementary students (Levy, 2013; Wendell & Rodgers, 2013). Not only does design thinking support interdisciplinary learning, it cultivates students' creative capacity for actively deepening learning as opposed to tendencies for a passive process of accepting learning as static (du Plessis & Webb, 2011; Sawyer, 2012).

As these STEAM instructional units develop across the three years of the grant, increasing percentages of instructional time will become interdisciplinary STEAM. A curricular goal of a minimum of two units per year per grade level at the elementary sites, with units approximately 5-6 weeks in length from grades 2-5, will equate to daily opportunities for all students to be immersed in interdisciplinary STEAM teaching and learning 20% of instructional time at the end of year 1, close to 50% of instructional time at the end of year 2, and close to 75% of the instructional time by the end of year 3, with progress continuing beyond the life of the grant. Continued district and partner support will ensure units continue to be revised and strengthened beyond the close of the grant.

To ensure active, successful participation in STEAM learning for all students, the interdisciplinary curricular design will draw from **Universal Design for Learning** (UDL) guidelines, defined in the Higher Education Opportunity Act of 2008 as a "scientifically valid framework for guiding educational practice." UDL facilitates the design and implementation of a flexible, responsive curriculum by developing options for how information is presented, how students respond or demonstrate their knowledge and skills, and how students are engaged in learning. Curriculum created with UDL

awareness provides the opportunity for all students to access, participate in, and progress in the general-education curriculum by reducing barriers to instruction.

Support for strengthening disciplinary instruction inside the STEAM units will come from the central office MSAP team, USD and other partnerships, district CCSS Resource Teachers, and other district departments. In addition, USD has pledged extensive academic support for teachers through the Mathematics and Computer Science Department, as well as the College of Arts and Sciences, the Shiley-Marcos School of Engineering, and the Mulvaney Center for Community Awareness and Social Action (CASA). Teachers from all levels will have opportunity to work with these experts in PLCs.

Science instruction inside the STEAM units will be heavily supported at all three sites. Teachers at the two elementary sites are working towards understanding of NGSS. Science materials in the district have not been rethought to meet the demands of the standards, and science professional development is not available. MSAP funding will be used to purchase NGSS-aligned FOSS kits as a support. MSAP team led workshops, PLC support, and classroom-embedded support, as well as support from USD professors, will focus on improving teacher content knowledge and understanding of science process skills.

Currently, the Montgomery science department consists of three teachers, one at each grade level. Instruction aligns with the old California state standards, so that 6th grade teaches Earth Sciences, 7th grade teaches Life Sciences, and 8th grade teaches Physical Sciences. As the department transitions to the NGSS, each grade level will be responsible for teaching standards in all three areas/domains of the sciences. As the

middle school develops STEAM units, science teachers will not only need to collaborate with teachers from other disciplines, but with each other in support of developing an articulation from one grade level to the next. The Montgomery teachers are excited about the opportunity to expand PLCs and participate in lesson study to learn from each other and science experts.

The SDUSD project will focus on the use of **technology** for creation, not just consumption. Through MSAP funding, SDUSD will support the three sites in implementing a Learning On the Go (LOGO) technology program, which will ensure technology is embedded in STEAM teaching and learning in meaningful ways. LOGO will provide students with a seamless use of technology between home and school, will enhance the development of STEAM teaching and learning, and will offer all parents opportunity to engage in the problem-seeing, problem-solving process. With central office MSAP team support and collaboration with the District's Ed Tech department, teachers will be supported in the process of embedding technology to lift learning in the moment, designing inquiry to necessitate authentic online research strategies, and serve as a vehicle for creative dissemination. The Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006), shown in Figure 3 below, will be used to ensure that the complex interplay of three primary forms of knowledge—Content (CK), Pedagogy (PK), and Technology (TK) —are incorporated into the design of STEAM curricula.

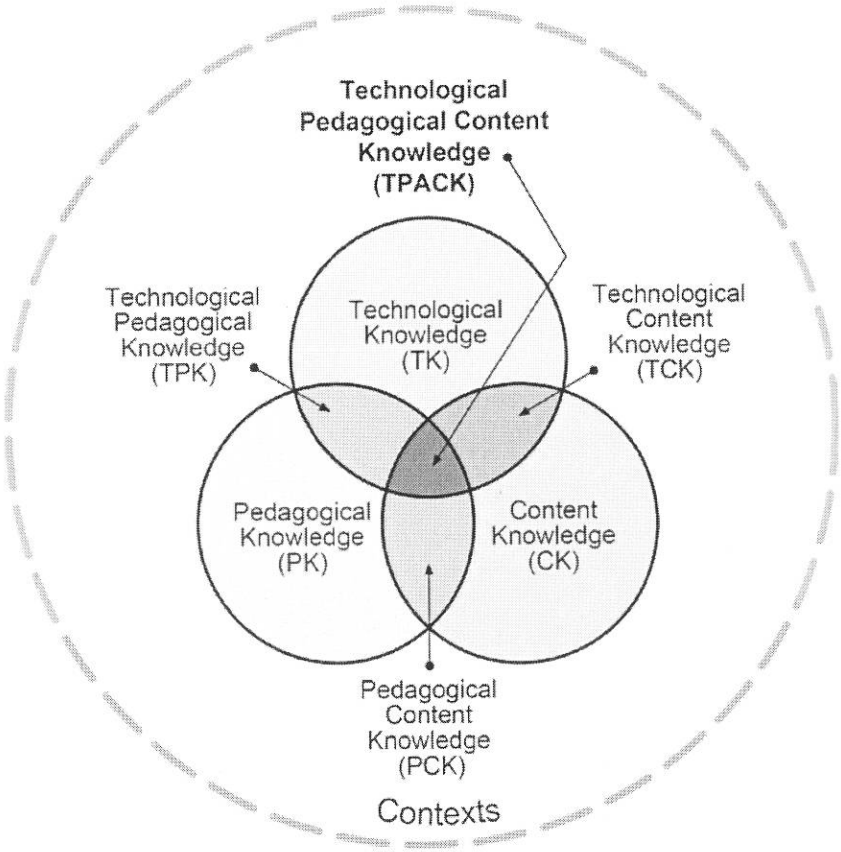

Figure 3. TPACK Framework

Figure Source: *http://www.matt-koehler.com/tpack/tpack-explained/*

The district's Education Technology department utilizes the SAMR Model as a means of assessing progress inside TPACK. Developed by Dr. Ruben Puentedura, "SAMR" is an acronym that stands for Substitution, Augmentation, Modification, and Redefinition. SAMR makes visible a progression of technology integration that may flow as follows:

- Substitution: Computer technology used to perform tasks similar in nature to what was done before computers. Example – digital worksheet completed by filling in blanks with answers in science.

- Augmentation: Computer technology is used to perform common tasks. Example - Digital science journal kept by single child using Microsoft Word only.
- Modification: Computer technology begins to extend learning in ways that transform the classroom. Example - Digital science journal kept using online collaborative spaces such as Google Docs for multiple users to think and problem solve together.
- Redefinition: Computer technology is used for tasks that were previously inconceivable. Example – Group of students use coding to create an app to help track science data.

The Central Office MSAP team will work with the Ed Tech department to design professional development for teachers in this progression of integrated technology, maximizing the LOGO program.

Engineering is the discipline most unfamiliar to teachers across the three proposed grant sites. Currently, the elementary sites have no instruction in engineering. Engineering at the middle school is limited to one section of the Mathematics, Engineering, Science Achievement (MESA) program (approximately 30 6th grade students) and Gateway to Technology (approximately 120 7th and 8th grade students).

The Committee on K–12 Engineering Education, established by the National Academy of Engineering and National Research Council Center for Education, noted that engineering education in classrooms does not always align with generally-accepted ideas about the discipline and practice of engineering. To provide a vision of what K–12

engineering instruction might look like, the Committee proposed three general principles:

- Principle 1. *K–12 engineering education should emphasize engineering design. The design process, the engineering approach to identifying and solving problems, is (1) highly iterative, (2) open-ended, in that a problem may have many possible solutions, (3) a meaningful context for learning scientific, mathematical, and technological concepts, and (4) a stimulus to systems thinking, modeling, and analysis.*
- Principle 2. *K–12 engineering education should incorporate important and developmentally appropriate mathematics, science, and technology knowledge and skills.*
- Principle 3. *K–12 engineering education should promote engineering "habits of mind." Engineering habits of mind are aligned with what many believe are essential skills for citizens in the 21st century. These include (1) systems thinking, (2) creativity, (3) optimism, (4) collaboration, (5) communication, and (6) ethical considerations.*

Interdisciplinary STEAM units that incorporate engineering in an interdisciplinary approach to problem-seeing and problem-solving meets the Committee's vision of engineering instruction. Furthermore, the focus on ethical considerations in engineering, or the ways engineering impacts people and the environment, fits well with engagement in social action and the development of global competence that will be facilitated through the partnership with World Savvy.

Professional development provided by the central office MSAP team will support teachers in developing an understanding of engineering process, and incorporating these processes into STEAM unit design. MSAP funding will provide for support materials such as Engineering is Elementary, which will support elementary teachers as they learn to incorporate engineering into unit design. MSAP funding will also support the creation of Maker Spaces at each grant site. These Maker Spaces will provide space for large-scale, ongoing projects that don't easily fit inside a classroom, equipment and tools such as 3D Printers, iMac computers for photo editing, and other social-media projects, building tools, and garden equipment.

Bringing Project Lead the Way Launch to the elementary sites, and encouraging greater participation in Gateway to Technology at the middle school, will create a K-12 continuum of Project Lead the Way in the Kearny STEAM Magnet pathway. Research has shown that students participating in Project Lead the Way K-12 score significantly higher on science and mathematics in the federally administered National Assessment of Educational Progress than students in a random, stratified comparison group (Bottoms & Anthony, 2005; Bottoms & Uhn, 2007).

An infusion of the **arts** into STEM is a deliberate response to the belief that art serves as a form of communication between human beings about important concepts, ideas, and understandings (Anderson & Milbrandt, 2005; Gardner, 1994; Langer, 1980; Goodman, 1978). While still Acting Secretary of Education, John B. King, Jr. emphasized the vital role of the arts in rethinking education, saying, "*There's evidence that kids get better at math when they've taken classes that make the connection between STEM and the arts-and that when they've had certain courses in the arts, kids*

can grow in self-confidence, and in linguistic skills, as well as in creativity…"

Partnerships with Art Reach, CoTA, Arts for Learning, and the San Diego Museum of Arts will support the MSAP project with arts instruction by bringing practicing artists into schools to work with teachers, students, and parents. CoTA will work with Carson, providing working artists to partner with teachers as they design and implement STEAM teaching and learning. The goal will be to infuse the arts throughout a unit as an added mode for constructing and communicating understanding. Each artist working with sites to infuse the arts will specialize in varied mediums such as sculpture, ensuring a robust variety of arts integration. Both Art Reach and Arts for Learning will partner with Carson and Montgomery, offering similar support.

The San Diego Museum of Art offers the support of working artists to lead arts explorations as a means of thinking and communicating for parent and community groups. Parents and community members will have opportunity to join in on STEAM inquiries focused on community needs, and draw from the arts as a means of lending their voice to the process.

Research shows that improved student achievement in **mathematics**, including equity of outcomes across socioeconomic and racial groups, requires improvements at multiple levels of a school system, including the district, the school and its leader, and classroom teachers (Cobb, McClain, Lamberg, & Dean, 2003; Rutter & Maughan, 2002; Smith, 2000). Support from the Teacher Development Group (TDG) will provide effective professional development for teachers and school leaders as well as district content specialists and leadership. The TDG is a nonprofit whose mission is to improve all students' mathematical understanding and achievement through meaningful,

effective professional development for teachers and school leaders. The TDG focuses on deepening teachers' and school leaders' knowledge of mathematics content, pedagogy, and leadership; building system-wide capacity to design, implement, and sustain instruction that aligns with research on how students learn mathematics and engage in mathematically productive habits of mind and habits of interaction; fosters the development of every student's mindset and self-identity as a capable mathematical thinker; and provide tools, strategies, and structures that will support a self-sustained culture of continuous mathematics professional learning and growth. TDG utilizes a "live" classroom model of professional development, so resource and classroom teachers and administrators are engaged in authentic observation, data collection, and dialogue about the implementation of a lesson whose plan they have co-developed and/or analyzed and refined.

The "live classroom," or Math Studio professional development model, includes high-quality, short-term workshops in which participants experience and analyze best practices in teaching mathematics and an innovative, apprenticeship component that involves a long-term, practice-based set of professional learning experiences. TDG's model draws on professional practice in the field and the predominant research on how students learn mathematics, effective mathematics classrooms, student conceptions of mathematical ideas, teacher generative growth, student motivation to learn, effective leadership, and effective professional learning communities (e.g., Carpenter et al., 2014; Dweck, 1999; Lampert et al., 2010; Middleton & Jansen, 2011; Saunders et al., 2009; Stein et al., 2009; Weiss et al., 2013). This embedded model offers real and relevant learning for teachers, and sustainable practices for continued professional

growth. Support from the TDG is intended to strengthen teacher's understanding of the enVisionMATH curricular materials, as well as mathematics instruction and application as students explore questions that math can answer inside STEAM inquiries.

Additionally, as noted earlier, SDUSD will form an Early Learner Collaborative (ELC) to support leadership, on-site STEAM-RTs, and primary classroom teachers in creating student-centered classrooms that support the development of inquiry and student agency inside STEAM units. Support for the ELC will be provided by Dr. Peter Johnston from the State University New York at Albany. Through PLCs and classroom inquiry, Dr. Johnston will support district and site leadership, STEAM-RTs and classroom teachers in investigations of the consequences of teaching decisions, particularly language choices, for the kinds of literacy and learning behaviors children acquire, the ways teachers and students build productive learning communities, and the implications of focusing on student engagement.

This classroom-embedded pedagogical support will emphasize the development of student collaboration, and explore the relationship between development of student agency and their engagement in active inquiry processes so necessary for success in integrated STEAM learning for all students. Although this work will originate with primary teachers from the two elementary sites, learning will be disseminated and opportunities to participate offered to all teachers across the three sites, and at the district level. This support will include the design of teacher action research for interested participants. Teachers involved in action research self-report that, "*they have learned more about effective instructional practices that directly impact student literacy performance through their inquiries*" (Elliott, 2007).

The central office MSAP team and teachers and leadership from Montgomery will work with World Savvy, a national education nonprofit that supports educators in integrating global competence teaching and learning into K-12 classrooms. World Savvy works closely with classroom teachers to sustainably and deeply integrate global competence into teaching and learning, with a focus on historically marginalized students. World Savvy defines global competence as follows:

> *Global competence refers to the knowledge, skills, and dispositions necessary to navigate and succeed in today's interconnected world. Globally competent individuals are life-long learners, have an appreciation for cultural differences, an ability to understand and consider multiple perspectives, critical and comparative thinking skills, problem solving abilities, comfort with ambiguity and change, and understand globally significant issues.*

The Partnership for 21st Century Skills—an advocacy coalition of educators and business, community, and government leaders—has identified global awareness as one of six core skills all students need to acquire. The added support of World Savvy in designing interdisciplinary STEAM curricular units will ensure units are designed not only for academic rigor, but to maximize the diversity being developed in the classrooms. Research has shown that engaging in design thinking provides rich opportunity for fostering 21st century competencies (Lee & Kolodner, 2011; Yelland, Cope, & Kalantzis, 2008), so the work of World Savvy will align well with interdisciplinary STEAM unit design.

World Savvy's support for site leadership, on-site STEAM-RTs, and classroom teachers will begin with workshops, but quickly transition to work inside PLCs composed of

interdisciplinary teams, individual mentoring, and online collaboration. The central office MSAP team will provide day-to-day support in between World Savvy visits, and ensure collaboration between the middle school and upper elementary teachers, who will be invited to collaborate and draw from the learning as well. As middle school teachers reach across traditional disciplinary boundaries, it is anticipated that initial efforts may combine two or perhaps three disciplines, and gradually grow in their range of disciplinary integration across the three years of MSAP support and beyond. Again, this process will take place in all classrooms for all students.

The development of relevant and rigorous STEAM curricular units at both the elementary and middle school level will also benefit from the partnership support of the University of San Diego (USD). USD is located a few short miles from the three proposed STEAM Magnet sites. USD is a Changemaker Hub, a designation awarded to higher education campuses that operate from a vision of higher education as a global driver of social change, actuated by transforming its students' educational experiences into world-changing experiences through social action. USD's engineering department has engaged in professional development in design thinking under the tutelage of IDEO, and will support the MSAP project in incorporating design thinking into unit design.

As noted above, SDUSD's MSAP project will be partnering with USD's Mulvaney Center for Awareness, Community and Social Action. The Mulvaney Center is already working with all three proposed Magnet sites in varied ways. However, the work lacks a systemic focus across the campuses, and in reach, as sites lack the funding to release teachers to engage in in-depth collaboration, learning, and planning. The Mulvaney Center has pledged support for the development of the proposed STEAM magnets by

working with teachers and students to link the community to the classroom through their efforts with the Bayside Center. This will bring community problem-seeing and problem-solving into teacher's process for STEAM unit design, resulting in interdisciplinary STEAM curriculum designed to engage students in and with their community, while developing academic strength and global competence.

For example, students exploring issues around food may be engaged in inquiries involving nutrition, food access, systems for distribution, the economy of farming, and cultural foundations of food preference. Students at a grade level will collaborate in their inquiries, then share these inquiries with other grade levels, as well as use other grade levels for data collection. A group may take on problem solving around access to food, given that the Linda Vista community does not have a major grocery store. In the process of problem solving, volunteers with the Mulvaney Center can provide opportunity for the students to plan for action with community members, and prepare to collaboratively address community and greater San Diego area leadership to appeal for action.

The Mulvaney Center has pledged support that extends beyond the life of the MSAP grant, with the intent to: support teachers in linking student learning to the wisdom of the community, allowing K-8 students to authentically explore the local connections to global issues in their own contexts; develop extended opportunities for K-8 students to participate in STEAM events and disseminate learning on a college campus; provide college mentors for academic support and development of empathy through storytelling (as empathy is key to working towards the ethical resolution of

complex social issues); and provide disciplinary and interdisciplinary professional development for teachers.

STEAM Assessment Practices

To assess student achievement and support STEAM unit revision, SDUSD developed a variety of rubrics in the 2013 MSAP grant (samples of these rubrics are included in Attachment 7). A Design Thinking rubric will support processes for stakeholder collaboration and student immersion in STEAM units, with a focus on the interplay among design thinking, engineering process, and embedded technology use. A STEAM curricular rubric will be used to assess the design of the units themselves, with a focus on unit flow and pedagogy. The rubric drives reflection and continued strengthening of processes of inquiry, design thinking, dialogic learning, introduction of a range of perspectives, and opportunity for the development of cultural proficiency. A science rubric focuses attention specifically on science content knowledge and science process. This rubric will be used by teachers in PLCs as each unit wraps up, supporting revision of the unit for the following year, and strengthening of science instruction across the year. These rubrics will be revised for this project, and an art rubric developed to focus attention on the use of the arts as a tool for communication, with the intent of supporting unit revision and strengthening of instruction across the year.

(2) The extent to which the applicant **demonstrates that it has the resources to operate the project beyond the length of the grant,** including **a multi-year financial and operating model and accompanying plan**; the **demonstrated commitment of any partners;** evidence of broad support from stakeholders (*e.g.,*

State educational agencies, teachers' unions) critical to the project's long-term success; or more than one of these types of evidence. (34 CFR 75.210)

SDUSD has a proven history of planning, implementing, and sustaining successful Magnet schools dating back to 1977, serving as a strong demonstration of its commitment of resources to operate the proposed MSAP project beyond the length of the grant. SDUSD's dedication to Magnet schools as a critical component in its desegregation plan was at the root of a release from a mandated court order and the transition to a voluntary plan in 1996.

From a financial standpoint, SDUSD sustains its network of 26 successful Magnet schools, many of which became possible because of MSAP funding, through a site-based budgeting process that involves use of site discretionary funds, added funding for specialized programs, and a process of request for added funding through the district's Chief of Staff.

The school site-based budgeting process, which develops into a site-controlled, multi-year financial and operating model, is a critical step in the SDUSD's Public Education Model. This investment model is part of a collaborative effort with the California State government to determine and provide what is needed to properly invest in students and classrooms to all but eliminate the achievement gap. In San Diego, the investment model highlights the estimated costs of education based on realistic expenditures aligned with the district's instructional objectives, and site-specific specialized programs such as Magnet themes, allowing SDUSD to take to scale smaller initiatives that have been proven to be successful in closing achievement gaps to

ensure each and every student will graduate high school career and college ready, and be vital future leaders for California.

Under this system, Magnet site administrators, teachers, and community members have the ability to focus funds on their site's Magnet theme. Magnet sites dedicate their budget resources to the sustainability of their program, purchasing specialized materials, thematic support teachers, and imaging and marketing. Administrators meet with teachers, parents, the School Site Council, and other advisory groups to prepare their spending plan.

Spending plans must support the Single Site Plan for Student Achievement, a key document that sets the goals, objectives, and operational plan for the year. The budget is divided into four areas: a base school allocation, central office support, categorical funds, and site discretionary funds. At Magnet sites, development and sustainability of magnet theme is first priority.

- **Base School Allocation.** This includes a principal and the classroom teachers sufficient to support a school's projected enrollment, based on the ratio approved by the Board of Education.
- **Central Office Support.** This is funded by the district's general fund and is at no cost to the schools. It includes School Police services, Information Technology staff, and a nursing pool. Schools will also receive a Visiting Teacher allowance to support PLCs, support from the Area Superintendent, and support from central office Common Core Resource Teachers, English Language Support Teachers, and other district department such as translation services. This also includes

support from the Neighborhood Schools and Enrollment Options department, which promotes and handles the application process for Magnet sites.

- **Categorical Funds.** This includes Title I and other federal and state programs, which are used for services that contribute directly to student academic achievement and support the Single Plan for Student Achievement. Examples are instructional materials, professional development, and parent involvement. At the MSAP sites, these funds will be directly invested into continued STEAM professional development, updating of materials, and key partnerships.
- **Site Discretionary Funds:** A formula is used to calculate Site Discretionary Funds based on enrollment and the school type. STEAM/STEAM instruction has been deemed a priority in the district for the 2016-17 school year and beyond, so MSAP sites will be receiving added discretionary funds for sustainability purposes. These funds may be used for STEAM-RTs, continued marketing and recruitment, partnerships and extended learning opportunities, STEAM-specific materials, and professional development.

SDUSD has designated STEM/STEAM, the Arts, International Baccalaureate, and Language Immersion for budget considerations beginning with the 2016-17 school year, adding extended financial support for these Magnet thematic pathways–existing, or being constructed as part of the strategic effort to strengthen the Magnet program overall. This prioritization will continue through the MSAP grant and beyond.

As added support for management and oversight, the Director of School Innovations works with the Executive Director of Facilities Planning and Design, who

oversees the development of academic pathways, and the Director of NSEO to ensure Magnet sites are attracting applicants, meeting diversity and academic goals, and working in collaboration with their K-12 pathway to ensure diversity built in the elementary magnets continues through the middle and high school programs. This team, in collaboration with school site leadership from the magnet thematic pathways and district departments directly related to the magnet theme, is working to develop theme-related academic and programmatic standards in rubric form for each pathway in alignment with the District's Vision 2020 goals, as well as revise recruitment efforts in keeping with changing social media practices. A draft version of the Vision 2020 and STEAM Magnet Programing alignment that will serve as a foundation for a STEAM Magnet rubric is located in Attachment 8. These efforts will help to further align the site-based budgeting process, efforts of on-site Magnet coordinators, and leadership to ensure financial and operational strength throughout the district's magnet program. This operational oversight team reports directly to the Chief of Staff to ensure goals of the District's magnet program are consistently at the forefront of district decision-making.

The MSAP program falls under the direct management of the Office of School Innovations. The Director supports sites with the site-based budgeting process, as well as with programmatic processes. During the implementation of a MSAP grant, SDUSD leadership inclusive of the Chief of Staff meets with the Director to monitor the progress of each site's sustainability plan and budgeting of discretionary funds, and plans for the continued needs of each site in the ensuing budget year to ensure resources to operate the project beyond the length of the grant.

To ensure the systemic commitment of all partners and the broad support from stakeholders critical to the project's long-term success, the MSAP team plans to expand the ways design thinking is employed, utilizing the process to inspire leadership and innovation at all levels of the project as administration, teachers, community members, and partners engage in a grassroots process for envisioning, designing, implementing, and communicating their STEAM Magnet. This iterative approach to the transformation into STEAM Magnets will ensure all stakeholders are fully vested in a continued process that will thrive beyond the life of the MSAP grant. Letters of support from teachers, all of whom are union members, parents, community members, and site-specific and project-wide partners, and commitment surveys signed by teachers and parents, located in the Optional Attachments, demonstrate the systemic commitment and support from a broad range of stakeholders.

Letters from USD, World Savvy, 3Rs Robotics, Treobytes, and many others demonstrate the commitment of a range of partners (see Attachment 5). Details of these commitments have been described earlier in this section.

Collaborations with State-level partners will also support sustainability of magnet programming. SDUSD is working with the California Alliance for Arts Education. Efforts funded by this initiative include the work of CoTA at Carson Elementary. This funding is slated to sunset with the close of the 2015-16 school year. With the support of MSAP funding, Carson will continue their work with CoTA, and Linda Vista and Montgomery will have opportunity to contract the support of our other arts partners. Mr. Russ Sperling, SDUSD Director of Visual and Performing Arts, will be joining the Board of the

California Art Education Association, linking the MSAP project to ongoing efforts at the state level.

SDUSD is also part of the K-8 California NGSS Early Implementation Initiative. This effort, directed by West Ed, brings together teams of teachers to work though understanding of the standards, changes to curriculum, and the development of scientific process. Teachers in SDUSD meet weekly at Franklin STEAM Magnet school, developed through the 2013 MSAP grant. Teachers from all three grant sites are involved in this project.

(3) The extent to which the training or professional development services to be provided by the proposed project are of sufficient quality, intensity, and duration to lead to improvements in practice among the recipients of those services. (34 CFR 75.210)

The design of interdisciplinary STEAM units, and the associated pedagogical shifts in keeping with constructivist and dialogic learning theory, will be fully supported by thoughtful, multi-leveled professional development based on the findings of the Committee on the Evaluation Framework for Successful K-12 STEM Education.

Following a 2011 report by the National Research Council (NRC) on successful K-12 education in STEM, Congress asked the National Science Foundation to identify methods for tracking progress toward the report's recommendations. In response, the NRC convened the Committee on the Evaluation Framework for Successful K-12 STEM Education. The committee developed 14 indicators for successful STEM education

(2013). The indicators highlighted in bold–numbers 2, 4, 5, 6, 9, and 14—reflect the committee's highest priorities, as they represent the points of greatest leverage to improve the education system and student outcomes in the STEM disciplines, and to make progress toward the goals of increasing the number of underrepresented students who pursue science and engineering degrees and careers, expanding the STEM-capable workforce, and increasing science literacy. The 14 indicators are:

1. Number of, and enrollment in, different types of STEM schools and programs in each district.
2. **Time allocated to teach science in grades K-5.**
3. Science-related learning opportunities in elementary schools.
4. **Adoption of instructional materials in grades K-12 that embody the CCSS for Mathematics and A Framework for K-12 Science Education.**
5. **Classroom coverage of content and practices in the CCSS and A Framework for K-12 Science Education.**
6. **Teachers' science and mathematics content knowledge for teaching.**
7. Teachers' participation in STEM-specific professional development.
8. **Instructional leaders' participation in professional development.**
9. **Inclusion of science in federal and state accountability systems.**
10. Inclusion of science in major federal K-12 education initiatives.
11. State and district staff dedicated to supporting science instruction.
12. States' use of assessments that measure the core concepts and practices of science and mathematics disciplines.
13. State and federal expenditures dedicated to improving the K-12 STEM teaching

workforce.

14. **Federal funding for the research identified in *Successful K-12 STEM Education***

As described above, SDUSD's MSAP project is designed to support strategies 1-8, 11 and 13 with instructional practices supported by strong theory.

The services provided by the central office MSAP team, in collaboration with proposed partnerships, will be focused on teacher professional development and collaborative curriculum writing, thoughtful purchasing and integration of disciplinary tools and materials, and the development of learning spaces necessary to lead to improvements in practice. Services will be coordinated by the Office of School Innovations, a high-quality academic leadership team which oversees the MSAP grant. The team is composed of the Director, Project Manager, STEAM Specialist, and Marketing and Arts Specialist, all disciplinary and pedagogical experts with years of experience in designing and implementing interdisciplinary inquiry-based instruction, inclusive of the development of STEAM teaching and learning in the 2013 MSAP grant.

Research continually affirms the importance of the teacher in student learning (Allington & Johnston, 2000), and an emerging body of STEM research confirms this critical relationship as essential to inspiring and preparing children to pursue STEM careers. Integrating STEM across the curriculum and embedding the arts into STEM instruction to develop STEAM teaching and learning will require intensive professional development for grant sites. SDUSD will focus on the school as the unit of change, designing professional development based on research by Darling-Hammond, with the

goal of fostering a school-wide culture in which all learners (teachers, students, and leaders) view STEAM teaching and learning as achievable for all students. Darling-Hammond (2009) synthesized research on professional development in education and noted five key characteristics of the most effective programs:

1) intensive, ongoing, and connected to practice;
2) focused on students' learning;
3) supportive of educators through mentorship and coaching while they rehearsed new leadership and teaching routines in "real time";
4) designed to align with local district goals, priorities, and initiatives; and
5) focused on the development of strong working relationships among teachers.

The professional development plan for the MSAP project includes workshops, teacher-to-teacher professional development, and peer support targeting content knowledge and pedagogical practice; assistance in implementing Common Core State Standards, Next Generation Science Standards, and California State Standards; creation and use of STEAM-based curriculum in the form of interdisciplinary units that follow a flow of design thinking; purchase of resources aligned to state standards; district-level support for disciplinary knowledge; and access to site-based support through the STEAM-RTs. The professional development will be on-site, cross-site, and beyond, with an emphasis on developing the professional learning networks and relationships necessary to sustain learning and focus beyond the close of the grant. The cross-site PD is particularly critical, as lateral sharing is seen as a necessary component of developing professional capacity (Fullan, 2006).

Workshops will include those held during the school day (with release using Visiting Teacher funding), after school, Saturday, and summer options. The workshops will be designed and led by the central office MSAP staff, in collaboration with the ELC, World Savvy, and USD. This collaboration will ensure efforts are cohesive, and all teacher groups are learning with and from other ongoing efforts. The District's CCSS Language Arts and Mathematics Resource Teachers and English Learner Support Teachers will be invited to lend their voices to magnet PD, ensuring alignment with district initiatives. Work with the CCSS in ELA and Mathematics and NGSS will be embedded into PD, ensuring STEAM units are designed with the disciplinary complexity necessary for high levels of student achievement. SDUSD has purchased the Units of Study in Opinion/Argument, Information, and Narrative Writing, K-8 Series as a support for language arts instruction. The central office MSAP team will work with teachers in PLCs to incorporate these units into the design of STEAM units, creating seamlessness in instruction and strong support for student achievement.

The three MSAP STEAM schools have established PLCs where teachers work collaboratively to share best practices for achieving better results for students. Funding will ensure PLCs are able to meet weekly, and support from STEAM-RTs and the central office MSAP team, will ensure emphasis on the development of inquiry-based dialogic instruction that creates integrated, collaborative learning environments and strengthens critical thinking. In PLCs, teams of teachers will take on the role of classroom researcher, collecting data for further understanding. These data will include use of rubrics designed to support incorporation of design thinking and interdisciplinary, inquiry-based units. Data and student work will be shared in PLC meetings, where

teachers will work towards inter-rater reliability and be supported in turning data into insights and further research questions driven by their own student needs. Analysis of data and new learning about the needs of students will lead to best practices for improving student achievement. Outcomes will be shared cross grade levels at each site and across the three sites themselves, as well as with colleagues across the District and beyond. A study of PLCs designed in this way found that, with this support, "teachers began to shift their planning from that which is highly teacher-directed to that which is more student-centered" (Edstrom & Harris, 2012). This shift is critical to teaching STEAM content, which requires an open-ended inquiry approach (Marshall & Horton, 2011).

As an example of the supports for sustainability that emerge from the PLC work, the Office of School Innovation is currently supporting STEAM Magnet sites from the 2013 MSAP grant in the design of STEAM units, inclusive of a focus on process as a means of developing life-long innovative habits of mind for students. Part of this process involves making thinking visible by creating tracks of thinking on the walls. Teachers are asking to chart student questions, hypotheses, and efforts through the flow of design thinking by posting charting and photographs, creating a timeline across the walls of the classrooms. This serves as living documentation of process to be used for student reflection. (It also serves as a tool for communicating with visitors, inclusive of district leadership and potential parents on tours.) This documentation can then photographed, and archived digitally with the units using Google Drive, a file storage and synchronization service created by Google. Google Drive allows teachers the capability to create shared folders for each grade level STEAM unit, hyperlink online

resources, store photographs of student process and store additional resource files associated with the unit. Overarching site curricular calendars can then be created, with hyper-links to each individual unit. This archiving methodology supports existing and any new leadership and teachers in planning the following year, and supports cross-site and cross-project collaborations.

Teachers will have access and some stipend support towards master's level, on-line course work at USD, such as "The Nature of Creativity and Innovation in STEAM", "STEAM and Special Student Populations", "Engineering Design Process in Math and Science Education", and "Artistic Modeling and Representation in Science and Math Education. As an example of the ways these courses will help teachers to more closely meet the needs of students, "The STEAM and Special Students Populations" course will give teachers an opportunity to research, discuss, and work collaboratively towards strategies to address STEAM specific instructional challenges for students. The course explores four critical questions: (1) Which students have not been served well in relation to STEM education?; (2) How have systems (technical and normative) constrained success for these groups?; (3) Which models (technical and normative) of success exist in relation to these populations?; and (4) How can these models be actualized in our own instructional practices?

Information gleaned from teachers who participate in the USD coursework, as with all professional development, will be woven into ongoing instruction and curriculum design. This added emphasis on research and instruction while strengthening content and process knowledge will enable teachers to better address student needs, thus improving student achievement. From a student standpoint, the outcome of teacher's

participation in PLCs will be increased time for inquiry as curriculum design shifts towards collaboration and the development of dialogic learning environments. In STEAM content learning, instruction will have added rigor and relevancy due to increased teacher content and process knowledge.

(4) The extent to which the proposed project is **supported by strong theory** (as defined in this notice). (34 CFR 75.210)

Through the development of a unique Magnet program, schools will focus on creating a K-8 STEAM articulation pathway that transforms teaching and learning. An infusion of multi-leveled professional development, curriculum writing, and the collaboration of an ecosystem of partnerships all focused on STEAM teaching and learning will increase student engagement, critical thinking, communication, problem solving, and improve student achievement. The resulting transformation in teaching and learning will create an attractive option for a diverse community and families throughout the district and beyond, increasing each site's diversity.

The design of this theory of change has been a collaborative process among district leadership; school site leadership; students, parents, and community members; and a range of partnerships. The collaborative spirit that developed this theory will support its implementation and plan for its sustainability. The logic models that follow, shown in Figures 4 and 5, serves as a tool to guide continuous improvement, alignment of objectives and measures, and benchmarking.

***Building a STEAM Pathway in the San Diego Unified School District* Logic Model: District**

Resources	Activities	Outputs	Short and Mid-term Outcomes	Long-term Outcomes
• 4 full time district staff in Office of School Innovations (MSAP team) with experience in building STEAM Magnets • MSAP funding • 1 CCSS Resource Teacher in Mathematics and the VAPA department • Professional networks within the Arts, STEAM, and higher education communities • Office of Neighborhood Schools and Enrollment Options support with Magnet applications and weighted lottery • 1 .15 FTE data analyst	• Implement management plan inclusive of meeting schedule for all collaboratives; • Provide multi-layered professional development on design thinking and interdisciplinary instruction; and all STEAM disciplines with an emphasis on arts and mathematics; • Partnerships engaged in professional development and community events; • Conduct multi-pronged outreach and recruitment plan • Implement weighted lottery	• New and additional opportunities for collaboration among teachers and partners, on-site and cross-site • Development of ecosystem of partnerships supporting networking with the community, support for interdisciplinary unit design; • Development of strong STEAM industry collaborations • New and increased opportunities for parent volunteerism; • Increase in number of applications to three sites	• Increased teacher knowledge and skills in STEAM and cultural competency; • Increased collaboration among teachers on-site and across sites, and with district and partnership supports; • Increased student content knowledge and understating of science, engineering design and artistic design; • Increased student proficiency in reading and math; • Increased integration of authentic STEAM into teaching and learning; • Increased knowledge and understanding among students and families of coding, robotics, and gardening; • Reduced minority and socio-economic group isolation among Hispanic and low income students; • Increased student enrollment	• Model of strong K-8 STEAM articulation pathway • Increased enrollment across the entire K-12 STEAM pathway; • Greater interest in STEAM related career and life choices; • Increased value for diverse learning environments

Figure 4. District Logic Model

***Building a STEAM Pathway in the San Diego Unified School District* Logic Model: School Sites**

Resources	Activities	Outputs	Short and Mid-term Outcomes	Long-term Outcomes
• Teachers and Administrative staff, 2 STEAM Resource Teachers per site; • Classroom teachers with knowledge and experience with CCSS, NGSS, best practices; • Categorical and discretionary funding; • Partnerships with experts in the areas of pedagogy, curricular design, and marketing; • Administrative Assistant to with Office of Neighborhood Schools and Enrollment Options	• Teachers meet in PLCs 10 hours per month for pedagogical support; • Development and implementation of interdisciplinary curriculum integrating design thinking and social action; • Workshops, PLCs, coaching and lesson study focused on the role of arts in a STEAM environment, art as social action, and mathematics instruction • Partnerships provide curriculum design support, design of authentic STEAM activities, and marketing support; • Develop school tours, initial imaging and marketing materials	• 2 interdisciplinary STEAM units per grade level by year; • New and increased opportunities for students to explore STEAM higher education programs and careers; • Authentic STEAM activities for students and families; • New and increased opportunities for parents/community volunteerism and school involvement; • Calendar of site participation in community and greater San Diego events; • Add # of magnet applications received for each site	• Increased teacher knowledge and skills in STEAM and cultural competency; • Increased collaboration among teachers on-site and across sites, and with district and partnership supports; • Increased student content knowledge and understating of science, engineering design and artistic design; • Increased student proficiency in reading and math; • Increased integration of authentic STEAM into teaching and learning; • Increased knowledge and understanding among students and families of coding, robotics, and gardening; • Reduced minority and socio-economic group isolation among Hispanic and low income students; • Increased student enrollment;	• Development of K-12 pathway of authentic STEAM teaching and learning; • Mutually beneficial long-term partnership between the University of San Diego and the three STEAM Magnets; • Improved community engagement

Figure 5. School Sites Logic Model

(c) Quality of Management Plan (15 points)

(1) The adequacy of the management plan to **achieve the objectives of the proposed project on time and within budget**, including clearly defined **responsibilities, timelines**, and **milestones** for accomplishing project tasks; and

SDUSD has created a thorough, collaborative plan to ensure effective management of *Designing a STEAM Pathway in the SDUSD*, enabling achievement of the objectives of the proposed project on time and within budget. This management plan was designed for the 2013 MSAP grant, which coordinated the development of four STEAM elementary schools. The management plan has been strengthened over the past three years as processes for effective oversight with inclusion of a range of perspectives and expertise, strategic collaboration, and open lines of communication were consistently assessed and revised. The 2016-19 MSAP initiative will benefit greatly from this strong management infrastructure.

The *Designing a STEAM Pathway in the SDUSD* management plan involves networking among all stakeholders through a mix of formal reporting and collaborative structures designed to ensure the MSAP project is fully aligned and coordinated with district initiatives, has a network of support and clear lines of communication within the district, and can tap districtwide and communitywide networks for support, dissemination, feedback, and reflection.

These efforts are led through the Office of School Innovation, home to the MSAP initiative, which is situated within the Department of Leadership and Learning. This office is responsible for implementation of the District's academic goals under *Vision*

2020, and the design and leadership of all professional development, including all efforts in support of CCSS and NGSS implementation and professional support for English Language Learners, Special Education, and Gifted and Talented Education. A full organizational chart for the District, which shows how the Office of School Innovation fits into the larger structure, is provided as in Attachment 8.

The Office of School Innovation is comprised of the Director, Program Manager, STEAM Specialist, and the Marketing and Arts Specialist. This team works collaboratively with the District, USDOE, the External Evaluator, school sites, community, and partnerships to ensure all aspects of grant implementation are being carried out effectively, on schedule, and on budget.

The Director of School Innovation, who will serve as the Magnet Project Director (1.0 FTE), is (1) responsible for all aspects of design, implementation, and reporting of the Federal MSAP grant. The Director also (2) works directly with the External Evaluator to assess progress towards approved goals, identify needs, and plan for next steps. She (3) is responsible for financial oversight of the MSAP grant. She (4) works directly with District academic leadership, the financial department, the Neighborhood Schools and Enrollment Options Office, Facilities and Planning, Data Analysis and Reporting, procurement and contracts, and other departments necessary for the implementation of the grant. She (5) collaborates beyond the district, establishing potential partnerships and communicating the vision for transformation to these key players. She (6) stays informed of theory, research, practice, and opportunities in order to ensure the project is continually evolving and focused on innovative goals, and (7) serves as the liaison to the USDOE MSAP Office, attending all grantee-related conferences.

To achieve the objectives and performance measures established for *Designing a STEAM Pathway in the SDUSD*, the Director will form and convene the STEAM Steering Committee, lead the STEAM Administrative Collaboratives, and co-plan the site STEAM-RT collaborative, all of which are opportunities for collective design, problem solving, communication, and reflection. Each is described below, with attention to its own function and the interactive nature of the three. The Director will work directly with the administration at each site and the Area Superintendent, with attention to the development of the magnet theme, progress towards academic and diversity goals, and the alignment of STEAM teaching and learning across the K-8 pathway.

The Director will take an active role in the developing ecosystem of STEAM partnerships to develop a vision for the project as a whole with attention to sustainability; the design of STEAM teaching and learning that melts the walls of the classroom, engages the community, and offers added layers of support for teachers, families, and students; and serves to strengthen the STEAM articulation pathway. She co-plans and co-leads STEAM professional development, inclusive of week-long Summer Institutes, STEAM Saturdays, site workshops, and PLC support.

The Director will network within the District, taking an active role in interdepartmental meetings within the Department of Leadership and Learning, and meeting directly with leadership from Visual and Performing Arts (VAPA), Ed Tech, and other departments critical for the development of best-in-class STEAM learning environments. She will stay in communication with the Executive Director of the Department of Leadership and Learning and the Chief of Staff to ensure the district is fully informed of progress towards MSAP grant goals.

The MSAP Project Manager (1.0 FTE) (1) will assist the Director in all aspects of the implementation, data collection, and reporting activities of the MSAP grant. The Manager (2) will monitor progress along proposed timelines and progress towards benchmarks, and works with the Director to revise and provide supports. She (3) will work closely with site administration, supporting the logistics of implementation, collaboration with district departments, and planning. She (4) will oversee consultant contracts and invoicing, monitors ongoing work and associated benchmarks. The Manager (5) serves as the main point of contact for technology integration.

To carry out these duties, the Project Manager will participate in the STEAM Administrative Collaboratives, and co-plan the site STEAM-RT collaboratives. She will co-plan and co-lead STEAM professional development inclusive of weeklong Summer Institutes, STEAM Saturdays, and on-site workshops. She takes an active role in PLCs, often co-leading with site STEAM-RTs, and provides individual teacher mentoring and coaching.

The Project Manager will lead the transition to the Learning On the Go (LOGO) program at all sites, which entails collaborating with the District's Ed Tech Department, supporting with inventorying and ordering, designing processes for management of equipment, designing teacher and parent workshops, and supporting logistical problem-solving. She will work side-by-side with Ed Tech leadership to ensure alignment with District technology procedures, and takes the lead on researching innovative processes for integrating technology seamlessly to lift ongoing instruction, and models this embedded use of technology during professional development.

The Project Manager will take an active role in the collaboration with project partners as they design a social action frame that engages students and community in solving local problems through the application of STEAM learning, ensuring collaboration across all partnerships and all grade levels.

The STEAM Specialist (1.0 FTE) (1) will support the development of a continuum of STEAM teaching and learning across the varied levels. She will (2) lead efforts to network teachers working with varied consultants, ensuring shared messaging and dissemination of learning. The STEAM Specialist (3) will maintain a focus on the articulation of STEAM curriculum as units develop, and orchestrates sharing of units across the two elementary sites, and vertical articulation from the elementary to the middle school. She (4) will support the site STEAM-RTs, networking their individual and collective efforts.

To fulfill this job description, the STEAM Specialist will take an active role in the STEAM Administrative Collaboratives, STEAM Leadership meetings, and STEAM-RT meetings. Furthermore, the STEAM Specialist will work closely with the Early Learners Collaborative, supporting ongoing professional development in between consultant visits and the design of STEAM curricula, and ensure purposeful inclusion of upper elementary teachers.

Along with the Project Director and Project Manager, the STEAM Specialist will co-plan and co-lead STEAM professional development inclusive of week-long Summer Institutes, STEAM Saturdays, and on-site workshops. She will take an active role in PLCs, often co-leading with site STEAM-RTs, and works closely with classroom teachers, offering one-to-one embedded support. She will support effective use of the

Maker Space and gardens as they develop, working side-by-side with teachers as they become comfortable with shifting pedagogies, new equipment, and new tools. She will communicate insights into professional development needs to the Manager and Director, ensuring the design of supports meets teacher needs.

The Marketing and Arts Specialist (1.0 FTE) (1) takes the lead on all aspects of imaging, marketing, and recruitment. He will (2) work closely with leadership at each site, researching and supporting the development of a deep understanding of their individual identity as a STEAM school, and their role in the larger articulation pathway. He will then (3) support the development of vision and mission based on insights, and create imaging and a range of marketing materials, (4) lead the transformation of physical space to communicate the STEAM theme, (5) lead development of marketing plans, and (6) lead sustainability planning.

To carry out these responsibilities, the Marketing and Arts Specialist will work to message each site's identity as a STEAM Magnet school. He will design signage for the exterior of the site, re-image the front office as a welcome center, and create art that messages the magnet theme on interior walls. He will support site leadership and STEAM-RTs in the design of site tours for prospective parents, evolving the tours as new instructional spaces such as the Maker Spaces and gardens develop. He will design all artwork, and the creative inclusion of student artwork, creating a bank of shared and site-specific images each can access after the grant comes to a close.

The Marketing and Arts Specialist will support the development of a marketing plan for each site. He will research community events, and mentor site leadership and teachers into strategies for participation. He will evolve the materials as each site's

identity evolves, ensuring they continually message the site's full potential. He will lead the transformation of each school's website, and work with teachers to develop their individual webpages. He will also network the sites with the District's communications department, and works in collaboration with the Manager and STEAM Specialist on the design of a project newsletter. He will take an active role in the collaboration with project partnerships, and works particularly closely with 3Rs Robotics and Biocom to network the sites in area STEAM events.

The Marketing and Arts Specialist will takes an active role in sustainability planning, with attention to developing mutually beneficial relationships with partners to ensure collaborations continue beyond the life of the grant. He will participate in the STEAM Administrative Collaborative and co-plan the site STEAM-RT collaboratives and professional development, with attention to the role of the arts, processes for making art, and the meaningful integration of art throughout STEAM unit design.

The Area Superintendent (district funded) for the three proposed grant sites works to orchestrate district supports for her schools, meeting with varied Leadership and Learning departments to network, envision, and plan. She sets the vision for each district cluster, networks the schools within the cluster, and connects them with community resources. Additionally, she works closely with site administrators, supporting their academic leadership, decision-making processes, and efforts to meet the needs of all students and families.

The Magnet School Administrators (district funded) are responsible for providing effective instructional leadership and mentoring of teachers, and are accountable for the school's operation. Their major responsibilities include the consistent re-envisioning and

growth of their educational program, effective management of professional and classified staff, students' academic and emotional development, facility maintenance and management, fiscal management activities, and developing effective community relations.

Through full participation in the Steering Committee and varied collaborations, steady progression towards the development of mutually beneficial relationships with community and partnerships, and regular involvement in professional development, the Area Superintendent and site Administrators will develop into the lead voices of the K-8 STEAM pathway, becoming the driving force for sustainability.

Two STEAM Resource Teachers (1.0 FTE each) will be hired at each school. Site-based STEAM-RTs will have proven expertise in STEAM content and experience with staff development. The STEAM-RTs will be hired with attention to complementary disciplinary expertise at each site to ensure a range of support. Pedagogical expertise in inquiry-based instruction and curriculum design will be prioritized.

The STEAM-RTs will share Site Coordination duties, overseeing daily operations, assisting with purchasing of materials, monitoring the site budget, and developing marketing materials; monitoring implementation and collecting formative and summative data and serving as site liaisons to the External Evaluator; and coordinating and hosting site tours and community/family events such as Science Night, Math Night, or Art Shows. These STEAM-RTs will also work directly with classroom teachers providing added professional development in STEAM content and processes and demonstrating and coaching teachers in effective STEAM-based instructional practices that emphasize

content process skills. They will also support with curriculum writing at each grade level, and articulation and scaffolding of curriculum across grade levels.

The MSAP Project Director, MSAP Project Manager, STEAM Specialist, and Marketing and Arts Specialist (hereafter known as the MSAP Team) will set up a network of collaborative opportunities to ensure clear communication, forums for varied perspectives, and opportunities for thoughtful feedback and revision are in place. The Director will form and convene a MSAP Steering Committee comprised of the MSAP team, site leadership and teachers, the Area Superintendent, and representatives from parents, community, and key partnerships. The Steering Committee will meet three quarters per year throughout the project to review progress, offer feedback, and help expand community support. As an example, at an early Steering Committee meeting for the current MSAP grant a conversation between a classroom teacher and higher education partner led to identifying the need for dedicated space to support inquiry-based, project-based work. The range of perspectives present included a local STEAM industry representative, who raised the possibility of a Maker Space. This suggestion resulted in the decision to develop Maker Spaces at all four campuses.

The STEAM Administrative Collaborative is a monthly opportunity for the MSAP Team, site administrators, and the Area Superintendent to meet and discuss implementation of the grant. Topics include analysis of data, monitoring of progress along the proposed timeline and benchmarks, budgets and expenditures, integration with district initiatives, and problem solving. Meetings will rotate school sites so that each hosting administrator has a chance for feedback and reflection on the evolving

nature of the program, and the visiting administrators have a change to observe the shifts in teaching and learning and changing imaging of the site.

The MSAP Team will meet monthly with site STEAM Leadership Teams, comprised of the Administrator and two STEAM-RTs, and varied stakeholders inclusive of partnerships, community, and family representatives dependent on topic. These meetings will continue the conversation from the Administrative Collaboratives, allowing for more targeted reflection and planning around progress of implementation, progress towards goals, and site-specific needs.

The MSAP team will meet two to four times per month with the site-based STEAM-RTs for added professional development, to share expertise and progress, to problem-solve, and share resources. These meetings will rotate sites so that all RTs have the opportunity to learn from each other's practice and ongoing collaborations. Figure 6 below illustrates the conversational through-lines that sustain *Designing a STEAM Pathway in the SDUSD*'s network of support for accomplishing project tasks:

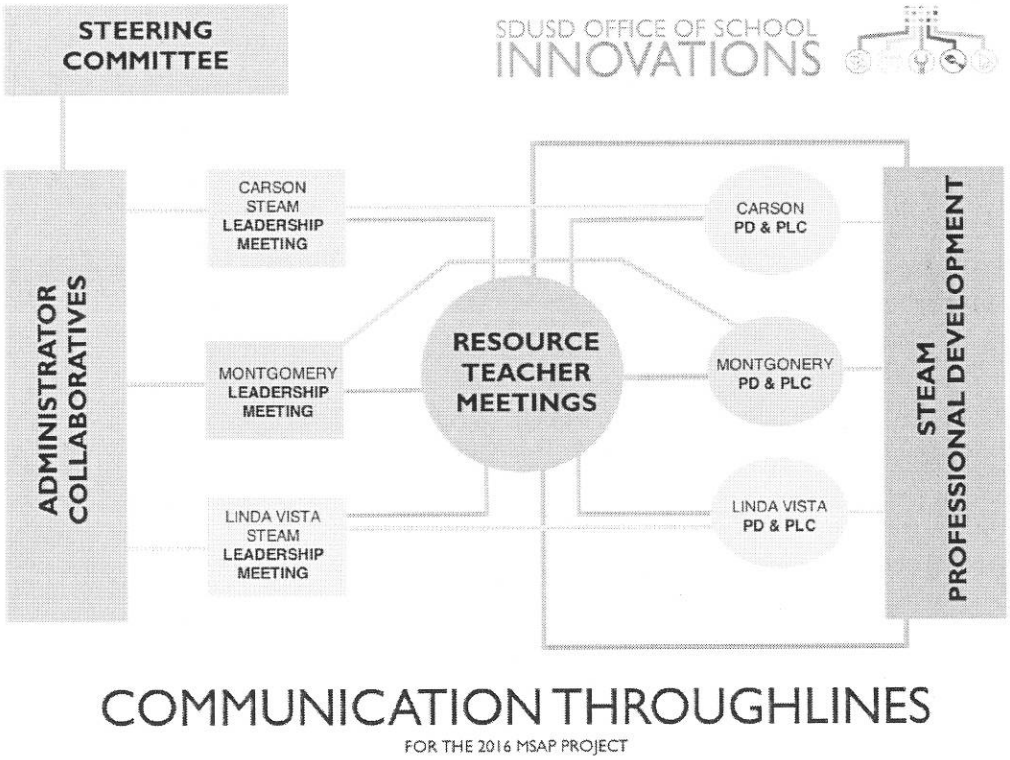

Figure 6. STEAM Pathway Network of Support

The External Evaluator will add value to the communication by virtue of the team's firsthand experience with the magnet schools. The Evaluator will visit the schools twice a year. Feedback will be provided through conversation with the Director and a rubric based on grant goals and objectives. The rubric will be shared with sites during the range of collaborations, and the insights used to plan next steps. Data the Evaluator collects and analyzes for Federal reporting will be used to drive reflection and forward planning as well (for a full discussion of the project's formative and summative evaluation activities, please see the Quality of Project Evaluation section).

Fiscal accountability and oversight are also part of the management plan. The district's Finance Office and grants accounting personnel are thoroughly familiar with

federal grant fiscal management and reporting procedures. The Director and the district's finance staff will meet regularly with each school to review procedures, expenditures, and item justifications.

A timeline for the implementation of *Designing a STEAM Pathway in the SDUSD,* found in Table 5 below is intended as a tool to support the effective management of the project, follows. Immediately after the timeline is Table 6, showing the key implementation benchmarks by major program component for each year of the grant. These two tools will be become key resources for the collaborative network described above, ensuring continued attention to timely progress towards goals.

Table 5. *Designing a STEAM Pathway in the San Diego Unified School District* Timeline of Activities													
		2016-17				2017-18				2018-19			
		Q1 (Oct - Dec)	Q2 (Jan - March)	Q3 (April - June)	Q4 (July - Sept)	Q1 (Oct - Dec)	Q2 (Jan - March)	Q3 (April - June)	Q4 (July - Sept)	Q1 (Oct - Dec)	Q2 (Jan - March)	Q3 (April - June)	Q4 (July - Sept)
Grant launch													
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Convene STEAM steering and leadership teams/collaborations to solidify vision, review grant objectives	Central Office MSAP Team, Principals, Area Superintendent, STEAM-RTs, Parents, and Teachers		X										
Sites conduct needs assessment for opportunities to create collaborative learning spaces	Central Office MSAP Team, Principals, STEAM-RTs		X										

Grant launch													
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Sites discuss goals of grant, begin detailed exploration of goals and objectives, align MSAP budget, work through processes for purchasing	Central Office MSAP team, Principals, STEAM-RTs, Administrative Assistants	X	X										
Prepare press releases	Director, Marketing/Arts Specialist, Area Superintendent, Principals	X											
Meet with MSAP Evaluator to discuss objectives and measures	Central Office MSAP Team, Principals, MSAP Evaluator	X											

Grant launch													
Key Task or Activity: Professional Development	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Define STEAM teaching and learning, conduct needs assessment for three year professional development plan	Central Office MSAP Team, Principals, STEAM-RTs, Partners	X	X										
Sites meet with existing partnerships to align work to grant objectives	Central Office MSAP Team, Principals, STEAM-RTs, Partners	X	X										
New partnerships/consultants introduced, initial planning for work	Central Office MSAP Team, Principals, STEAM-RTs, Partners, Teachers		X										
STEAM curriculum writing and unit design rubric introduced at initial STEAM workshops and PLCs	Central Office MSAP Team, Principals, STEAM-RTs, Teachers, Partners	X	X										

Grant launch													
Key Task or Activity: Extended Learning	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Survey students, parents, community, partners to identify interest in various authentic STEAM club offerings	Principals, STEAM-RTs, Parents, Students		X										
Sites develop initial marketing plan begin imaging/branding process	Marketing/Arts Specialist, Principals, STEAM-RTs	X	X										
Initial planning for STEAM school- and community-based events	Marketing/Arts Specialist, Principals, STEAM-RTs, Teacher Leaders	X	X										
Individual sites assess need for enhancement/beautification sites	Marketing/Arts Specialist, Principals, STEAM-RTs, District Facilities Dept.	X	X										

Grant launch													
Key Task or Activity: Extended Learning	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Conduct assessment of communities for established and potential partnerships	Marketing/Arts Specialist, Principals, STEAM-RTs	X	X										
Establish school tour protocol for prospective parents	Marketing/Arts Specialist, Principals, STEAM-RTs, School Office Staff	X	X										
Ongoing Activities													
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Meet with STEAM leadership teams/collaborations to plan and review progress towards grant objectives	Central Office MSAP Team, Principals, Area Superintendent, STEAM-RTs, and Lead Teachers	X	X	X	X	X	X	X	X	X	X	X	X

Ongoing Activities												
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Meet with STEAM steering committee	Central Office MSAP Team, Principals, STEAM-RTs, Parents, Teachers, Partners			X		X		X		X		X	
Implement plan for Maker Space and other collaborative spaces such as the garden	Central Office MSAP Team, Principals, STEAM-RTs, Parents, Teachers, Partners					X	X	X		X	X	X	
Meet with MSAP Evaluator to discuss progress towards grant objectives, communicate/report to DoE	Central Office MSAP Team, MSAP Evaluator, Principals, STEAM-RTs			X		X	X	X		X	X	X	

Ongoing Activities													
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Strengthen parent groups (PTA/PTO or Foundations) aligning to schools vision and STEAM objectives	Principals, STEAM-RTs, Parents, Teachers, Partners			X	X	X	X	X	X	X	X	X	X
Professional development plan revised to ensure a focus on diverse learning environments, design thinking, and role of arts in STEAM interdisciplinary curriculum and instruction	Central Office MSAP Team, Principals, STEAM-RTs, Teachers, Partners			X	X	X	X	X	X	X	X	X	X
Sites prepare plan and implement LOGO program	Principals, STEAM-RTs, Teachers, Partners			X	X	X	X	X	X	X	X	X	X

Ongoing Activities													
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Professional development with World Savvy, USD, Dr. Peter Johnston, and other partners planned and implemented	Central Office MSAP Team, Area Superintendent, Principals, STEAM-RTs, Parents, Teachers, Partners		X	X	X	X	X	X	X	X	X	X	X
Community engagement through USD partnership planned and implemented	Central Office MSAP Team, Area Superintendent, Principals, STEAM-RTs, Parents, Teachers, Partners			X		X	X	X		X	X	X	
Identify club leaders and meeting locations/times and cycles for student rotation, revise quarterly	Principals, STEAM-RTs, Partners			X		X	X	X		X	X	X	

Ongoing Activities													
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Identify community events and greater San Diego events for participation	Marketing/Arts Specialist, Principals, STEAM-RTs, Partners, Parents			X	X	X	X	X	X	X	X	X	X
Network with industry representation for added opportunities to build authentic STEAM learning	Marketing/Arts Specialist, Principals, STEAM-RTs, Partners, Parents, Community			X	X	X	X	X		X	X	X	
Sites revisit vision mission statement and marketing plan	Marketing/Arts Specialist, Principals, STEAM-RTs					X		X		X			
Sites conduct weekly school tours for perspective families	Marketing/Arts Specialist, Principals, STEAM-RTs			X		X	X	X		X	X	X	

Ongoing Activities												
Key Task or Activity: Operational/Leadership	**Personnel Responsible**	**Year 1**				**Year 2**				**Year 3**			
Develop range of STEAM family and community events (fairs, content specific opportunities)	Principals, STEAM-RTs, Teachers, Students, Partners			X		X	X	X		X	X	X	
Enrollment guide and targeted mailings prepared in conjunction with enrollment options window opening	Marketing/Arts Specialist, Principals, STEAM Resource Teachers	X	X			X	X			X	X		
Magnet student lists sent to schools for enrollment	Marketing/Arts Specialist, Principals, STEAM-RTs			X				X				X	

Benchmarks that will serve as measurable evidence of yearly progress have been determined as follows:

Table 6. SDUSD MSAP Project Benchmarks		
Operational / Leadership		
Year 1 2016-2017	**Year 2 2017-18**	**Year 3 2018-19**
• Schools develop first draft of STEAM magnet vision and mission • Creation of calendar and agendas of STEAM leadership, STEAM-RT, and STEAM Steering Committee meetings • Alignment of MSAP, categorical, and discretionary budgets to support ongoing development of STEAM magnet • Grant shared with staff and community	• Schools revise STEAM magnet vision and mission • Creation of calendar and agendas of STEAM leadership, STEAM-RT, and STEAM Steering Committee meetings • Maker Space designed and schedule developed for use by teachers • Alignment of MSAP, categorical, and discretionary budgets to support development of STEAM magnet	• Creation of calendar and agendas of STEAM leadership, STEAM-RT, and STEAM Steering Committee meetings • Schools revise STEAM magnet vision and mission • Maker Space schedule revised for use by teachers • Alignment of MSAP, categorical, and discretionary budgets to support development of STEAM magnet

Table 6. SDUSD MSAP Project Benchmarks, cont.		
Professional Development		
Year 1 2016-2017	**Year 2 2017-18**	**Year 3 2018-19**
• Professional development plan created by district and school sites • Partnerships introduced to teachers • Development of agendas for PLCs, lesson study, and professional development workshops • Development of STEAM content and unit design rubrics • First 2 STEAM units developed by teachers	• Revision of professional development plan • Development of agendas for PLCs, lesson study, and professional development • Revision of Year 1 STEAM units • 2 additional STEAM units developed by teachers • LOGO devices in use	• Revision of professional development plan • Development of agendas for PLCs, lesson study, and professional development • Revision of Year 1 and 2 STEAM units • 2 additional STEAM units developed by teachers • LOGO devices in use

Table 6. SDUSD MSAP Project Benchmarks, cont.		
Extended Learning		
Year 1 2016-2017	**Year 2 2017-18**	**Year 3 2018-19**
• STEAM club interest surveys • First round of Extended Learning offerings created, schedule and sign-in sheets collected	• Extended Learning offerings revised, schedule and sign-in sheets collected • Expansion of partnerships	• Extended Learning offerings expand, schedule and sign-in sheets collected • Expansion of partnerships
Marketing/Recruitment		
• Initial marketing materials created • Website revised to highlight new magnet • Targeted mailings sent • Sustainability planning begins • Current partnership agreements established • Tour process developed	• Marketing materials revised • Website revised to highlight magnet program and STEAM events • Targeted mailings sent • Sustainability planning incorporates teachers, partners, community • Partnership work documented • New partnerships established	• Vision statement reviewed/revised • Marketing materials revised • Website updated • Targeted mailings sent • Sustainability planning finalized for year 4 • New partnership agreements documented

(2) How the applicant will ensure that a **diversity of perspectives** are brought to bear in the operation of the proposed project, including those of **parents, teachers, the business community, a variety of disciplinary and professional fields,** recipients or beneficiaries of services, or others, as appropriate.

Through this MSAP project, the MSAP team will employ a range of strategies to ensure that a diversity of perspectives are brought to bear in the operation of the proposed project. The MSAP team plans to expand the ways design thinking is employed, utilizing the process to inspire leadership and innovation at all levels of the project as administration, teachers, parents, community members, and partners engage in a grassroots process for envisioning, problem-seeing and problem-solving, designing, and communicating. This iterative approach to the transformation into STEAM Magnets will ensure all stakeholders are fully vested in a continued process that will thrive beyond the life of the MSAP grant.

To ensure continued reflection and feedback, SDUSD's MSAP project will develop a Steering Committee, described above, which will allow timely input from a range of stakeholders. Voices of families, community, and the full range of partnerships inclusive of higher education, industry, and instructional/pedagogical personnel will help administrators, teachers, and the MSAP team gauge the impact of the project, and alignment to family and community needs.

Each site has a parent organization in various stages of development. The Project Manager will support the strengthening of these organizations, and work with site

leadership to develop processes for routinely communicating implementation news and engaging parents in processes for support and feedback.

Each site has a School Site Council (SSC), composed of the administrator, one classified staff member, two to three teachers, two to three parents and two to three community members. The SSC is responsible for the Site Based Budgeting process, described in the Need for Assistance section. Sites also have a School Governance Team (SGT) with a similar make-up. The SGT makes policy and programmatic recommendations, and works in concert with the SSC to align programs, budgets, and benchmarks. These two committees will provide crucial input and guidance for the development of STEAM programming throughout the grant, and be key voices in the sustainability process beyond the grant.

Outreach events ranging from Family Friday and Coffee with the Principal to family and community STEAM nights will provide opportunity for presentation, sharing of information, reflection, conversation, and feedback. The evaluation process led by the External Evaluator will actively encourage site and project-wide reflection and continuous revision to ensure the design of the project is in alignment with family needs.

(d) Quality of Personnel (10 points)

(1) The project director (if one is used) is qualified to manage the project

The Director of SDUSD's Department of School Innovation, Maria Nichols, will be directly responsible for implementation of the MSAP grant. Ms. Nichols has been an educator in SDUSD for 28 years, with experience that includes classroom teacher,

Master Teacher, Elementary Professional Development Center Demonstration Teacher, Literacy Coach, MSAP Site Magnet Resource Teacher, Central Office MSAP Resource Teacher, and MSAP Project Manager.

Ms. Nichols holds a California Clear Administrative Services Credential, a Master's degree in Curriculum Design from San Diego State University, and was National Board Certified in 2005 with re-certification in 2010. Additionally, she has a California Language Development Specialist Credential, a Literacy Coach Certification from San Diego State University, and she received the Distinguished Elementary Educator Award from the San Diego chapter of Phi Delta Kappa in 2002.

Ms. Nichols has gained a national reputation for her work in classroom-based literacy and the development of dialogic learning environments, and has served as a literacy consultant to school districts across the U.S. Through this work, Ms. Nichols emphasizes the design and implementation of dialogic learning environments, which teaches students the potential of varied perspectives when thinking and talking collaboratively. Ms. Nichols has published four professional texts intended to support classroom teachers in developing dialogic learning environments: Teaching Literacy in First Grade (Guilford, 2005), Comprehension Through Conversation (Heinemann, 2006), Talking About Text (Shell, 2008), and Expanding Comprehension with Multigenre Text Sets (Scholastic 2009), as well as numerous articles.

Ms. Nichols is highly experienced with magnet schools, with over 13 years of experience as a Site Magnet Resource Teacher, Magnet Department Resource Teacher, MSAP Project Manager, and Director of School Innovations, which oversees magnets and the MSAP grant. As a Magnet Resource Teacher, Ms. Nichols led the

design of the overall professional development program to support sites in transforming into their learning environments to fully incorporate the Magnet theme. She worked with teachers to design interdisciplinary curriculum with inquiry-based, problem-based instruction, supported teachers in developing richly dialogic classrooms that offered diverse groups of students opportunities to learn with and from each other, and was responsible for the thoughtful use of budgeted grant funds.

As the MSAP Project Manager and then Director of School Innovations, Ms. Nichols has been responsible for the design, implementation, oversight, and reporting of MSAP grants for the last five years. She has full responsibility for the current MSAP grant, leading the project schools in re-envisioning and goal setting, recruiting and marketing, designing and implementing theme-based curriculum and developing inquiry-based learning strategies, and developing sustainability through community and philanthropic networking. Ms. Nichols is responsible for hiring and overseeing the External Evaluator, working with the District's research and department to secure needed data, coordinates the formative and summative evaluation of the program, and disseminates information to district leadership and the grant sites.

(2) Other key personnel are qualified to manage the project; and

Central Office MSAP Team

Supporting the MSAP Project Director are the other members of the Central Office MSAP Team, which includes the MSAP Project Manager, the MSAP STEAM Specialist, and the MSAP Marketing and Arts Specialist. The MSAP Team works collaboratively to support all aspects of the development of MSAP grant sites.

Ms. Sarah Trueblood (1.0 FTE) will serve as the MSAP Project Manager. Ms. Trueblood has 15 years of experience that includes teaching elementary and middle school Science, English, and Engineering at a STEM magnet school; IB Coordinator and Vice-Principal at an IB STEAM Magnet school; and Project Manager for the current MSAP STEAM grant. She holds a Bachelor of Arts degree in English from Indiana University, a Master's degree in Math, Science and Technology from the University of San Diego, and a California Clear Administrative Credential.

Ms. Trueblood brings expertise in the areas of science, engineering, technology, and design thinking to the central office team. She draws from her background in elementary science instruction to develop and support science and engineering learning environments, the development of robotic teams, and the use of gardens as instructional environments that engage community members alongside students. Her professional development experience also includes designing and leading district i21 technology workshops, ensuring district teachers understand and are able to implement technology-embedded instruction. She has the knowledge of hardware, software, supportive curricular materials, digital tools and apps, and their applications for teaching and learning, as well as the ability to support strategic technology purchases. Ms. Trueblood will strengthen the awareness of the possibilities technology, including a Learning on the Go (LOGO) program, brings to teaching and learning. An initial emphasis will be on determining teachers' comfort level with the technology in order to work towards meaningful integration with ongoing instruction.

Ms. Jeralyn Johnson (1.0 FTE) will serve as the Central Office STEAM Specialist. Ms. Johnson has 12 years experience as an educator and in leadership, including

experiences as a classroom teacher at a SDUSD MSAP grant site, Site Literacy and Math Coach, and Central Office Resource Teacher for the current MSAP STEAM Grant cycle. She holds a Bachelor of Arts degree from San Diego State University and a Master of Education degree in Curriculum and Design from The University of San Diego, and has earned a Tier I California Administrative Credential and California State Mathematics Specialist Certificate.

Ms. Johnson brings expertise in the areas of literacy, mathematics, digital literacy, social media, and the pedagogies necessary for inquiry instruction to the central office team. She has extensive experience with designing and leading professional development and facilitating grade-level planning, and coaching teachers in the implementation of effective instructional strategies. Ms. Johnson focuses specifically on formative assessment, working alongside teachers to support the cycles of implementation, assessment, and reflection necessary to continuously grow as professionals. In her current role as central office resource teacher for the 2013-16 MSAP grant, Ms. Johnson has been responsible for the support of site Resource Teachers as they plan and implement PLCs, and feeding insights from the PLC and coaching work forward into the larger on-site and cross-site professional development design.

Mr. Rob Corona (1.0 FTE) will serve as the Central Office Marketing and Arts Specialist. Mr. Corona has a BA in Fine Arts with an emphasis in Graphic Design from San Diego State University and an MA in Educational Leadership from Point Loma Nazarene University. In addition, he holds a Multiple Subjects Bilingual Cross-Cultural Clear Credential with a supplementary authorization in Art, a Specialist in Spanish

Credential, and a California Clear Administration Services Administrative Credential. Mr. Corona has a background as a commercial graphic artist, classroom teacher, vice principal, program specialist, intern support provider, intern program instructor, and resource teacher. He has been working for the SDUSD for 24 years.

Currently, Mr. Corona supports MSAP grant sites with imaging, branding, marketing, and recruitment in service of their diversification and enrollment goals. His work with imaging is responsive to each site's journey, evolving as site communities find their own unique identity within their theme. Mr. Corona actively leads sites through website redesign with this evolving imaging in mind, ensuring sites are informative, engaging, and constantly updated. He is also responsible for the re-envisioning of MSAP sites' public spaces, including the transformation of front offices into welcome centers, signage, and evidence of theme throughout the site. He collaborates with site leadership, STEAM-RTs, site partners, school foundations, and parent groups to design marketing campaigns that promote each site's events and fundraisers. His efforts include designing marketing and recruitment materials, developing marketing plans, and creating online and printed promotional pieces.

As STEAM sites engage in local and greater San Diego STEAM fairs, he works with them to design booths and plan for strategic engagement of the public. In addition, he supports professional development by bringing in the arts as part of the foundation of unit design by emphasizing the power of art to inspire and communicate in a problem-based approach to learning. Mr. Corona also provides extensive research on community, local business, and philanthropic efforts to support the development of sustainable partnerships, and works with sites to develop their sustainability plans.

Mr. Alan Perlman will serve as the Systems Analyst for the MSAP grant (.15 FTE). His position will be shared with the Neighborhood Schools and Enrollment Options department. Mr. Perlman has worked in information technology and database management for over 28 years, with vast experience in extracting and interpreting information from a wide variety of data sources. His work with the Office of School Innovations includes data extraction and analysis from diverse data sources, inclusive of the District's student information system, school choice application database, District facilities databases, and the State of California data systems.

District Leadership

The Kearny cluster of SDUSD is led by Area Superintendent Kimie Lotchtefeld. Ms. Lotchefeld holds a Master's Degree in Education and a California Clear Administrative Services Credential. Ms. Lotchefeld's work includes the leadership of 23 K-12 schools in the Kearny and Mission Bay Clusters of SDUSD. She had 15 years of experience as a site Administrator prior to her move into the Area Superintendent position, including work transforming an elementary site into a STEAM-themed school. Ms. Lotchefeld is responsible for developing the capacity of principals in the area of instructional leadership and community building; collaborating with community stakeholders to ensure input and outreach in monthly cluster forums; overseeing budget building with site administrators and district teams aligned to services to maximize outcomes for all learners; and providing instructional leadership and support for site programs such as Linked Learning and Project Lead the Way.

Ms. Lotchefeld hired the Administrators at all three proposed grant sites in response to the Linda Vista community's request for the development of a STEAM

elementary and middle school pathway into the Kearny Complex, a STEAM Magnet High School. She will be an active voice in the implementation of the MSAP grant, taking part in the MSAP Steering Committee, the Administrative Collaborative, the project's partnership work across the K-8 pathway, and the design of staff development.

School Site Personnel

Two credentialed on-site MSAP STEAM-RTs with proven expertise in STEAM content and pedagogies and experience with staff development will be hired at each site. District leadership for Science, Technology, Engineering, Art, and Mathematics will be asked to identify potential candidates with content and process expertise, and experience with content-specific professional development. Preferred candidates will have knowledge of instructional strategies that support diverse populations, experience with professional development design and implementation, including coaching, knowledge of materials and curricular supports, and/or experience in STEAM-related disciplines. Each individual selected for the MSAP STEAM-RT position will have a valid teaching credential, a bachelor's degree (master's degree preferred), and at least five years of successful experience, preferably in a magnet school environment. The job description for this position is presented in the Optional Attachments.

Each School Administrator was hired in part because of his or her belief in and dedication to the development of STEAM teaching and learning, as requested by the Linda Vista community. Administrators are responsible for providing effective instructional leadership and are accountable for the school's operation. Their major responsibilities include the development of the educational program, managing professional and classified staff, student development, facility maintenance and

management, fiscal management activities, and developing effective community relations. As described in the paragraphs that follow, each proposed magnet site has an administrator with extensive educational experience and a proven track record in leadership of academic reform in diverse learning environments.

The Administrator at Carson Elementary, Ms. Courtney Young, has eight years of experience as a site Administrator at a range of sites in SDUSD. Her experience includes leading school redesign, transforming school culture, and developing STEAM teaching and learning. Previously, Ms. Young worked as Science Staff Developer for the SDUSD K-12 Alliance to support quality science instruction. This experience, coupled with her background as an elementary and middle school science teacher and her leadership work in science at the District level, make Ms. Young ideally suited to lead Carson's transformation into a STEAM Magnet school. Ms. Young has already initiated the change process, cultivating collaborations with the Collaboration of Teachers and Artists (CoTA) and the TDG math group. Ms. Young works in collaboration with resident artists to integrate Arts into Social Studies, ELA, Math, and NGSS science instruction.

The Administrator at Linda Vista Elementary, Mr. Michael Beraud, has 16 years of experience as a Site Administrator, including Vice-Principal roles at a Bilingual Magnet School and a STEAM elementary school. Within SDUSD, Mr. Beraud has served as a classroom teacher, school site Resource Teacher, and Central Office Resource Teacher before moving into Administration. He holds a Master's Degree in Instructional Leadership and a second Master's Degree in Instruction and in Educational Administration. Mr. Beraud attended the Technology Leadership Academy, San Diego

County Office of Education and has a Telecommunications Management Certificate. He has worked to launch aspects of STEAM instruction at Linda Vista and two previous sites, including the recruitment of two USD professors to offer extended learning in science. He has served on a STEAM committee and collaborated closely with parents that worked in technology and engineering fields to discuss, develop, and teach a STEAM curriculum to the K-5 students. Mr. Beraud has also served on the Board of Directors for the Administrators Association of San Diego and was the co-chair of the Administrators Association of San Diego Planning Committee. He is also a member of the Linda Vista Town Council and has addressed the Linda Vista Planning Group concerning school issues.

The Administrator at Montgomery Middle, Ms. Stephanie Brown, has two years of experience as a site Administrator. Ms. Brown holds a Single Subject Teaching Credential in Foundational Mathematics, a Masters of Education Administration, and a California Tier 1 Administrative Services Credential. Additionally, she has a rich background in Special Education. Ms. Brown has focused on the development of partnerships between Montgomery Middle School and community organizations, agencies, and universities to provide increased access to opportunities and resources to students and teachers. She has taken the lead on development of collaborative relationships with all cluster elementary schools, including Carson and Linda Vista and the Kearny Cluster STEAM Magnet high school, to support the K-12 alignment in the Linda Vista community. Her work has laid a foundation for the development of the K-8 STEAM pathway leading to Kearny.

Metis Associates will serve as the Project Evaluators. Metis Associates, a national research and consulting firm with deep expertise in educational evaluation, has a proven track record assisting MSAP grantees to meet their evaluation and reporting needs. These evaluations, employing a wide variety of data-collection and analysis methods, provide feedback on the district's success in meeting federal objectives and performance indicators associated with school desegregation, capacity building, and student achievement. Senior Associate Claire Aulicino, a seasoned MSAP evaluator, will lead the external evaluation.

Résumés for all key personnel and a job description for the on-site STEAM-RTs are presented in Attachment 3.

(3) Teachers who will provide instruction in participating magnet schools are qualified to implement the special curriculum of the magnet schools.

The federal Elementary and Secondary Education Act (ESEA), also known as the No Child Left Behind Act (NCLB), required all teachers of core academic subjects to be "highly qualified." In general, ESEA required that each teacher must have: (1) a bachelor's degree, (2) a state credential (or an Intern Certificate/Credential for no more than three years), and (3) demonstrated subject-matter competence for each core subject he or she will teach. As SDUSD prepares to transfer to the Every Student Succeeds Act, inclusive of teacher and leader evaluation and support systems, these standards are being upheld.

All Teachers in SDUSD must have (1) a Bachelor's degree, (2) a California Clear

Credential, either Multiple Subject (K-6) or Single Subject (6-8) (6th grade might require dependent on whether the 6th grade position is at an elementary site or a middle school site), and (3) the California Cross-cultural Language and Academic Development (CLAD) Authorization. Preliminary California Teaching credentials are earned after a fifth year of education courses and student teaching. A Professional Clear Teaching credential requires additional course work and three years of successful teaching experience. To be Highly Qualified, teachers must be teaching in a position that is a direct match for their credentialing.

Opportunities to interview to teach in an elementary magnet school are open to all credentialed teachers who are NCLB Highly Qualified and have expertise or interest in the grade level and the magnet theme. All teachers at the three proposed Magnet sites are Highly Qualified under NCLB requirements, and all positions are filled. When vacancies occur in a Magnet site, the seniority process for placement is waived. Administrators are able to interview all teachers who apply to ensure the most qualified candidate is identified, as opposed to being limited to the five most senior applicants.

SDUSD does protect teachers who have "Particular Kinds of Service (PKS)" from being bumped from positions by more senior candidates. PKS designation is given to positions in specialized school such as Magnets, where teachers have received extensive and specialized professional development in service of a school theme. For example, teachers at past and current MSAP projects focused on International Baccalaureate and STEAM with an emphasis on Project Lead the Way and other STEAM related professional development receive PKS protection. For example, as classroom teachers at all three sites participate in the extensive professional

development to be provided through MSAP funding, they will fall into the PKS category.

(e) Quality of Project Evaluation

The Secretary considers the quality of the evaluation to be conducted of the proposed project.

SDUSD proposes to retain Metis Associates to conduct the program evaluation of the MSAP grant initiative. Metis is an educational research and evaluation firm that has provided technical assistance and professional support for a wide range of education and human services initiatives for over 38 years. Metis has conducted evaluations of MSAP initiatives over the past nine MSAP funding cycles for nine community school districts in New York City; Broward County, FL; Baltimore County; Champaign, IL; Orangeburg County, SC; and Beacon, NY. Metis has also conducted system-wide evaluations and audits of magnet and choice programs for several large school districts including for Montgomery County (MD) Public Schools in 2015, Broward County in 2014, Baltimore County Public Schools in 2013, and Pittsburgh Public Schools in 2008. Final reports for these evaluations have been posted on the districts' websites.

Metis has a duly-constituted Institutional Review Board that is registered with the U.S. Department of Health and Human Services and assures compliance with Federal-Wide Assurance requirements for the Protection of Human Subjects. Metis will collaborate with the District's research department to secure approval for all activities conducted for the evaluation of the magnet initiative.

The evaluation of the SDUSD MSAP initiative will be directed by Claire Aulicino, a Senior Associate at Metis. Ms. Aulicino has directed evaluations of MSAP grants over

the past five MSAP funding cycles and she has served as the lead evaluator for 11 MSAP grants. Ms. Aulicino will be supported by highly qualified staff and will regularly consult with Metis's Design Consulting Committee on all aspects of the evaluation. The evaluation team will participate in all USDOE Project Directors meetings and will assist SDUSD in fulfilling all compliance monitoring or other program-related requirements. Ms. Aulicino's résumé is provided in Attachment 3.

(1) The Secretary determines the extent to which the methods of evaluation provide for examining the effectiveness of project implementation strategies.

The evaluation is designed to assess the implementation of project activities and the extent to which the activities support achievement of the project outcomes and outputs, as articulated in the district and school logic models. The evaluation design includes formative and summative components and utilizes multiple measures over multiple groups of subjects. Data from all sources will be synthesized and analyzed to maximize precision of outcome information and enrich the capacity of the Project Director and the SDUSD MSAP stakeholders to make informed and timely decisions about program development and implementation.

The formative evaluation will focus on program implementation and assessment of project activities. Ongoing formative feedback will be provided to the Project Director and the school-based magnet teams about the extent to which project activities are being implemented as planned and in line with the intended outcomes. This feedback and data will be critical for ensuring that the project is well-positioned to meet its objectives and for developing program adjustments as part of a continuous

improvement model. Formative evaluation methods, including documentation reviews, written surveys, interviews, and biannual field observations, will be conducted to answer key questions about: the outreach and recruitment strategies being used; how the schools are planning, developing, and implementing the themes and ensuring that all students have access to magnet thematic curricula and activities; the types of staff development being offered and the levels of participation in these; and the collaborations, among instructional staff, within the school community, and with external partners, being fostered to support the program. Project status reports, ongoing informal communication, and presentations by the evaluator will provide the Project Director and SDUSD District leaders, and other audiences with formative feedback on program implementation and best practices.

Summative evaluation activities will be conducted to assess the impact of program evaluation on the intended outcomes, as outlined in the logic models and project performance measures. The summative evaluation methods will include the analysis of data collected through monthly program implementation logs, stakeholder surveys, enrollment and applicant pools, standardized achievement test scores and district-end-of-course exams, and student thematic performance rubric results.

(2) The Secretary determines the extent to which the methods of evaluation include the use of objective performance measures that are clearly related to the intended outcomes of the project and will produce quantitative and qualitative data to the extent possible.

This section presents the four project-level objectives for the SDUSD magnet initiative, the project performance measures that will be used to assess the extent to which the objectives are being met in each year of the grant, and the specific methods that will be used to collect and analyze data to evaluate impact on each performance measure.

Project Objective 1: Promote voluntary desegregation in public schools by reducing MGI in two elementary and one middle school with substantial proportions of Hispanic students. The following performance measures will be used to evaluate the extent to which Project Objective 1 is met over the grant period.

Performance Measure 1.1 (GPRA Measure): Through implementation of a whole-school magnet programs, each magnet school will achieve reductions in minority group isolation among Hispanic students. The proportions of Hispanic students will be reduced at each school by the following percentages for each year, as shown in Table 7 below.

Table 7. Percentage of Reductions in Hispanic Minority Group Isolation

	Year 1 (2016–17)	Year 2 (2017–18)	Year 3(2018–19)
Carson ES:	62.8% to 61.6%	61.6% to 59.5%	59.5% to 56.4%
Linda Vista ES:	76.2% to 74.5%	74.5% to 71.6%	71.6% to 68.0%
Montgomery MS:	64.5% to 62.9%	62.9% to 60.6%	60.6% to 57.2%

Performance Measure 1.2: As a result of ongoing outreach and student recruitment efforts and the development of innovative educational programming, student enrollment at each of the magnet schools will increase by 5% in Year 2 and Year 3 of the grant over the prior year, compared with baseline data collected in Year 1.

Performance Measure 1.3: As a result of ongoing outreach and student recruitment efforts and the development of innovative educational programming, the number of applications to each of the magnet schools will increase by 5% in Year 2 and Year 3 of the grant over the prior year, compared with baseline data collected in Year 1.

Evaluation Methods for Project Objective 1: Data to assess performance measures 1.1 and 1.2 will be obtained from an annual analysis of student enrollment data from the District's registers for all active students as of October 1 of each project year. Frequency calculations will conducted by school and grade to determine the number and proportion of students by racial/ethnic group. Performance measure 2.3 will be assessed with data from the district's magnet program application data to determine the number of applications received for each school in each project year. Results from the enrollment and application data will be synthesized with data on outreach and recruitment logs and marketing materials for each school and the District to assess the effectiveness of the outreach and student recruitment plans.

Project Objective 2: Increase academic achievement among all students in participating STEAM schools. The following performance measures will be used to evaluate the extent to which Project Objective 2 is met over the three-year grant period.

Performance Measure 2.1 (GPRA Measure): At each magnet school, the percentage of students in each racial/ethnic group, students with disabilities, low-income students, and ELLs who score proficient or above on the Smarter Balanced State Assessments in ELA will meet state targets in each year of the project.

Performance Measure 2.2 (GPRA Measure): At each magnet school, the percentage of students in each racial/ethnic group, students with disabilities, low-income students,

and ELLs who score proficient or above on the Smarter Balanced State Assessments in math will meet state targets in each year of the project.

Performance Measure 2.3: At each magnet school, the percentage of students in each racial/ethnic group, students with disabilities, low-income students, and ELLs who score proficient or above on MSAP-created science understanding and conceptual knowledge rubrics will increase by 10 percentage points in each year of the project.

Performance Measure 2.4: At each magnet school, the percentage of students in each racial/ethnic group, students with disabilities, low-income students, and ELLs who score proficient or above on MSAP-created engineering/technology rubrics will increase by 10 percentage points in each year of the project.

Performance Measure 2.5: At each magnet school, the percentage of students in each racial/ethnic group, students with disabilities, low-income students, and ELLs who score proficient or above on MSAP-created artistic design process rubrics will increase by 10 percentage points in each year of the project.

Evaluation Methods for Project Objective 2: Performance measures 2.1 and 2.2 will be assessed using data from Smarter Balanced Assessment Consortium (SBAC) exams that are administered annually to students in ELA and math for grades 3-8. Results for these tests are expressed both in scale scores and performance level equivalents. Scale scores are equal-interval, criterion-referenced scores that create a continuous scale that extends across grade levels. For each grade, scores are categorized into one of four performance levels where Levels 3 and 4 indicates "proficient" and "above proficient," respectively.

Student achievement results will be derived from performance level analyses to calculate the proportions of students in each year who score at or above proficient. Chi Square Tests of Independence or other appropriate statistical measures, such as McNemar tests, will be conducted to determine if changes in student achievement occur from one year to the next and if differences in achievement by student subgroup are statistically significant. All analyses will be conducted by school, by grade level, and by student subgroup, including each major racial and ethnic group, students with disabilities, low-income students, and ELLs, except in cases where the number of students in a category is less than 10 and therefore insufficient to yield statistically reliable information, and/or where the results yield personally identifiable information.

Performance measures 2.3 through 2.5 will be assessed using data from locally-developed performance rubrics designed to measure: 1) science process and content knowledge; 2) engineering process and content knowledge; and 3) artistic design process for students in all grade levels. Data will be analyzed to determine the proportion of students who achieve mastery in each year.

Project Objective 3: Advance systemic reforms at each MSAP site, improving the quality of STEAM-based instruction and integration strategies in each classroom. The following performance measures will be used to evaluate the extent to which Project Objective 3 is met over the three-year grant period.

Performance Measure 3.1: Through their participation in magnet-related professional development, the proportion of teachers in each school who integrate instructional strategies addressed in magnet professional development (design thinking, dialogic learning, Universal Design for Learning, etc.) into curriculum and lesson plans will

increase by 10 percentage points in Year 2 and 15 percentage points in Year 3, compared with baseline data collected in Year 1.

Performance Measure 3.2: Through their participation in magnet-related professional development, the proportion of teachers in each school who demonstrate an increase in STEAM content knowledge and confidence in teaching STEAM subjects will increase by 10 percentage points in Year 2 and 15 percentage points in Year 3, compared with baseline data collected in Year 1.

Performance Measure 3.2: As part of the development and implementation of the magnet programs, the proportion of teachers in each school who collaborate with colleagues from their magnet site and across magnet site will increase by 5 percentage points in Year 2 and 10 percentage points in Year 3, compared with baseline data collected in Year 1.

Performance Measure 3.3: Through students participation in whole-school STEAM magnet programs, student attitudes toward STEAM and interest in STEAM-related careers will increase by 10 percentage points in Year 2 and 15 percentage points in Year 3, compared with baseline data collected in Year 1.

Evaluation Methods for Project Objective 3: Data to assess Performance Measures 3.1 and 3.2 will be derived from an analysis of responses to a survey of instructional staff that will be developed by the external evaluator in consultation with the school- and District MSAP staff, and will be analyzed using frequency and cross-tabulation calculations by school and for the project. The survey will be administered to all instructional staff at each magnet school in the spring of each project year to collect data on staff's knowledge and usage of key concepts addressed in the magnet

professional development, confidence and attitudes toward teaching integrated STEAM content, and levels of collaboration among teachers, as well as measure awareness and support for the magnet program and their participation in and satisfaction with program planning.

Data to assess Performance Measure 3.3 will be collected through the administration of a student survey in grades 3-8 in each year of the grant. The survey will be designed to assess student perceptions of the STEAM program and its effect on their interest and attitudes toward STEAM content and careers.

The student and staff surveys will be pilot-tested in Year 1 with item analyses and reduction conducted to ensure validity and reliability of the items in measuring the intended outcomes.

Project Objective 4: Increase parental and community engagement and satisfaction regarding the three STEAM schools. The following performance measures will be used to evaluate the extent to which Project Objective 4 is met over the three-year grant period.

Performance Measure 4.1: Attendance of parents at school STEAM events will increase by 10 percentage points in Year 2 and 15 percentage points in Year 3, compared with baseline data collected in Year 1.

Performance Measure 4.2: Volunteerism and mentoring by parents and community members will increase by 10 percentage points in Year 2 and 15 percentage points in Year 3, compared with baseline data collected in Year 1.

Performance Measure 4.3: Attendance of parents at student-parent-teacher conferences will increase by 10 percentage points in each year of the grant.

Performance Measure 4.4: Parent satisfaction with each school will increase by 15 percentage points in Year 2 and 15 percentage points in Year 3, compared with baseline data collected in Year 1.

Evaluation Methods for Project Objective 4: Data to assess Performance Measures 4.1 through 4.3 will be collected through a review of program documentation, including sign-in sheets and attendance logs from STEAM events and school-wide activities to measure parent participation and volunteerism, and from student-teacher-parent conferences to measure parent attendance in conferences. Performance Measure 4.4 will be assessed with an analysis of responses to a locally-developed parent survey. The survey will be administered to parents in each of the three schools in the spring of each project year to collect feedback on parental satisfaction with the magnet program. The parent survey will be available online and in paper copy, and will be translated into languages other than English and will use language that will accessible to parents of a variety of backgrounds and education levels.

The following measurement framework, shown in Figure 7 below, will be used to guide the program evaluation. The framework outlines the indicators; measures of change; and the data collection methods, sources, and timeline of the activities that will be conducted to assess progress toward meeting each of the project objectives to be addressed over the three-year MSAP grant.

SDUSD MSAP Program Evaluation Measurement Framework

Outcomes/Outputs (as per logic model)	Indicators	Measures of Change	Data Collection Methods	Data Sources	Frequency of Data Collection
Outputs					
Ecosystems of partnerships with community and industry organization to support for interdisciplinary unit design and STEAM experiences	Number of magnet partners	Increase in number of magnet partners	Program documentation, interviews with magnet staff and principals	Partner agreements, interview protocols	Biannually
New and increased opportunities for parent volunteerism and participation (Performance measures 4.1 through 4.4)	Number of parents who participate in magnet events and volunteer opportunities at schools	Increase in number of parents who volunteer at school, participate in school events, and attend conferences	Review of program documentation, administration of parent survey	Parent attendance and sign in sheets, parent survey	Annually
Increase in number of applications to three sites (Performance measure 1.3)	Number of magnet applications by school	Increase in number of magnet applications by school	Analysis of magnet application data	SDUSD magnet application data file	Biannually
Short-term and intermediate outcomes					

Figure 7. SDUSD MSAP Program Evaluation Measurement Framework

SDUSD MSAP Program Evaluation Measurement Framework, cont.

Outcomes/Outputs (as per logic model)	Indicators	Measures of Change	Data Collection Methods	Data Sources	Frequency of Data Collection
Reduced minority group isolation in magnet schools (Performance measure 1.1)	Proportion of students in each racial/ethnic group compared to total school population	Reduction in the proportion of Hispanic students compared with the total school population	Analysis of the proportion of students by racial/ethnic group enrolled in each school	SDUSD Official Student Rosters as of October 1	Annually
Increased student enrollment (Performance measure 1.2)	Total student enrollment at each school	Increase in total student enrollment	Analysis of student enrollment by school	SDUSD Official Student Rosters as of October 1	Annually
Increased student proficiency in reading and math (Performance measures 2.1 and 2.2)	Student proficiency on state assessments in ELA and math	Increase in proportion of students score at or above proficiency on state assessments	Review of student scores on state assessments	SBAC assessments in ELA and math (grades 3-8)	Annually
Increase student content knowledge and understating of science, engineering design and artistic design (Performance measure 2.3)	Student proficiency of locally-developed student performance rubrics	Increase in proportion of students score at or above proficiency on rubrics	Review of student scores on performance rubrics	Locally developed rubrics for science, engineering, and artistic design process	Annually

Figure 7. SDUSD MSAP Program Evaluation Measurement Framework, cont.

SDUSD MSAP Program Evaluation Measurement Framework, cont.

Outcomes/Outputs (as per logic model)	Indicators	Measures of Change	Data Collection Methods	Data Sources	Frequency of Data Collection
Increase teacher knowledge and skills in STEAM (Performance measure 3.1)	Demonstration of knowledge and skills related to STEAM and PD	Increase in proportion of staff who demonstrate an increase in knowledge and skills related to STEAM and PD	Analysis of staff survey data, teacher focus groups, principal interviews, class observations	Staff surveys, Observation and interview protocols	Annual survey, biannual site visits
Increased collaboration among teachers on-site and across sites, and with district (Performance measure 3.2)	Level of collaboration among magnet teachers	Increase in proportion of staff who report collaboration with other magnet teachers	Analysis of staff survey data, teacher focus groups, principal interviews	Staff surveys, Observation and interview protocols, Agendas and sign-in sheets	Annual survey, biannual site visits
Long-term outcomes					
Increased enrollment across the entire K-12 STEAM pathway	Total student enrollment across STEAM magnet pathway	Increase in total student enrollment across programs	Analysis of student enrollment by school	SDUSD Official Student Rosters	Annually
Greater student interest in STEAM related career and life choices (Performance measure 3.3)	Students reporting interest in STEAM content and careers	Increase in number of students reporting interest in STEAM content and careers	Analysis of student survey data	Student survey	Annually

Figure 7. SDUSD MSAP Program Evaluation Measurement Framework, cont.

(3) The Secretary determines the extent to which the methods of evaluation will provide performance feedback and permit periodic assessment of progress toward achieving intended outcomes.

The evaluation plan will include the use of quantitative and qualitative methods to collect and yield reliable, objective, and quantifiable formative and summative data regarding the proposed project's progress in achieving its performance measures, including program implementation and impact. Both formative and summative data will be collected from multiple respondents using multiple methods. All data will be triangulated to incorporate perspectives from the diversity of program stakeholder groups. The findings will be synthesized to objectively *document* the effort expended to implement program activities and determine the *effectiveness* of project activities and *efficacy* of the project in relation to outcomes achieved.

Results of the external evaluation will be provided to the Project Director through monthly communications and status updates and biannual summary reports. The evaluator will also provide ongoing informal feedback as data are collected and participated in the monthly MSAP meetings that are conducted by the Project Director. Ongoing feedback will ensure that the evaluation supports continuous improvement of the project.

The results of the quantitative and qualitative data analyses will be synthesized and presented by SDUSD to the USDOE in the Annual Performance Reports and Ad-Hoc Reports for each project year, including a final report at the end of the grant period. Metis will assist SDUSD staff in preparing the reports to present succinct findings about

the success of the project in meeting the intended outcomes that are outlined in the project objectives and performance measures. The District will also provide data to the USDOE to report on progress on the six project level measures as required by Government Performance and Results Act (GPRA).