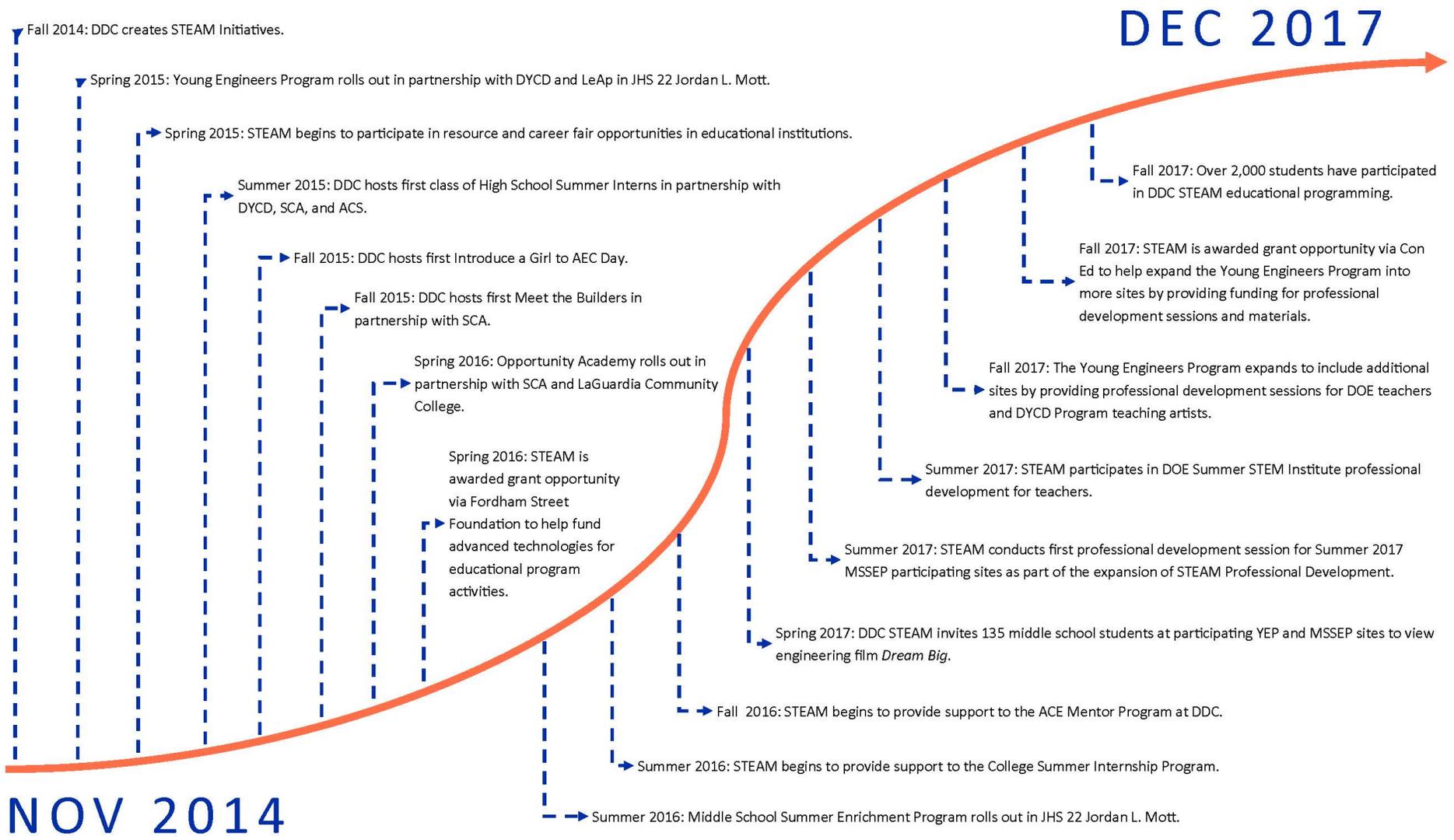


NYC DDC STEAM INITIATIVES

2017 YEAR END REPORT





NOV 2014

DEC 2017

DDC STEAM | HIGHLIGHTS

- Since 2015, DDC STEAM has collaborated with the following city agencies, organizations, and educational institutions to implement and maintain STEAM-related educational programming for the youths of NYC:

CITY AGENCIES

NYC Administration for Children Services
NYC Center for Youth Employment
NYC City Council
NYC Department of Cultural Affairs
NYC Department of Education
NYC Department of Environmental Protection
NYC Department of Homeless Services
NYC Department of Youth & Community Development
NYC DOE Career Technical Education
NYC DOE STEM Department
NYC Mayor's Fund
NYC Mayor's Office Flash Mentorship Program
NYC Mayor's Office Climate Policy & Programs
NYC Parks Foundation/Education Division
NYC Service
NYC School Construction Authority

ORGANIZATIONS

ACE Mentor Program
After-School All-Stars Program
American Society of Civil Engineers
ASPIRA
Beacon Program
CASITA Maria
Coro Foundation
East Side House Settlement
Fordham Street Foundation
Grant Associates
Hispanic Families Coalition
Immigrant Social Services
LeAp
Lower East Side Girls Club
NY Chapter of the National Organization of Minority Architects
Sports & Arts Foundation
Union Settlement

EDUCATIONAL INSTITUTIONS

Academy of Mount St. Ursula
Aquinas High School
Brooklyn Generation School
Bronx Design and Construction Academy
Cardinal Hayes High School
City College Academy of The Arts
City Polytechnic High School of Engineering, Architecture, and Technology
Columbia University
Ebbets Field Middle School
Gregorio Luperon High School
Hamilton Grange Middle School
High School for Construction Trades, Engineering, and Architecture
IS 119
IS 131
IS 281
IS 392
IS 49
JHS 125 Henry Hudson
JHS 145 Academy for Creative Education and the Arts
JHS 22 Jordan L. Mott
JHS 8
JHS 88 Peter Rouget

Jonas Bronck Academy
LaGuardia Community College
MS 325 Urban Science Academy
MS 328 Millennium Business Academy
MS 394
PS 126
PS 127
PS 18 Park Terrace
PS 7
Robert F. Wagner, Jr. Secondary School for Arts and Technology
Urban Assembly Academy for Civic Engagement
Washington Heights Academy
Williamsburg HS for Architecture and Design
Young Women's Leadership Academy

- Since 2015 through the DDC Young Engineers Program, STEAM has reached 553 middle school students at 19 various New York City schools and after-school programs.
- Since 2015, the DDC High School Summer Internship Program has enrolled 87 high school students from 53 New York City schools, and our College Internship Programs (both DDC and DYCD Ladders for Leaders) have enrolled 120 local and national college students.
- Since 2015, 76 high school students have joined ACE Mentor Program of America TEAM 8 and have collaborated with DDC professionals in national design competitions. In 2017, ACE Team 8 has 5 female participants, compared to 0 female participants in 2016.
- Since 2015, STEAM has implemented and/or participated in 64 external community events including Introduce a Girl to AEC Day events, Take Our Children to Work Day events, Meet the Builders events, street fairs, school career days, and parades throughout New York City.
- Since 2015, a total of **2,148** students have been involved in STEAM educational programming.

EXPANSION OF STEAM

- In order to reach larger numbers of students in 2017 we began to focus on providing enhanced professional development opportunities to NYC public school teachers and after-school educators. STEAM collaborated with Dr. Leonisa Ardizzone, former Executive Director of the Salvadori Center, to produce the DDC educational curriculum “Building the Future”. With this curriculum, middle school students learn about the built environment and DDC buildings and infrastructure. Students are immersed in a project based learning model as they explore concepts in engineering and architecture to design and build their final project.
- **MSSEP June 2017:** STEAM and Dr. Leonisa Ardizzone conducted the first “Train the Trainer” for educators and teachers from sites participating in the DDC STEAM 2017 Middle School Summer Enrichment Program (Washington Heights Academy, Lower East Side Girls Club and LeAp). Participants were introduced to the *Building the Future* curriculum, and were able to apply the knowledge they gained during the Train the Trainer sessions to enhance their teaching over the summer program. STEAM Program Coordinators also taught 2 classes (25 students in each class) at the Washington Heights Academy. A total of **150 students** participated in DDC’s 2017 MSSEP Program.
- **DOE Summer STEM Institute August 2017:** DDC STEAM also participated in the 2017 NYC DOE Summer STEM Institute and received glowing reviews from the classroom of 25 DOE math and science teachers who participated in the class.
- **YEP Fall September 2017:** As part of the expansion of STEAM programming, STEAM and Dr. Leonisa Ardizzone conducted a Train the Trainer session for the DDC 2017 Fall Young Engineers Program. Prior to the expansion of YEP, an average of **55 to 60 students** from **3 sites** participated in each semester of YEP. STEAM Program Coordinators were also personally providing instruction to each student participant. For Fall 2017, STEAM provided **5 sites** with the necessary tools to implement the *Building the Future* curriculum for **213 students** in the following sites: Hamilton Grange Middle School, IS 281, Jonas Bronck Academy LeAp, Washington Heights Academy, and IS 131 ASPIRA.
- **Spring 2018 Young Engineers Program:** STEAM will continue to host professional development for educators in future Young Engineers Program participating sites. In Spring 2018, STEAM will pilot DDC’s new **Coastal Resiliency Curriculum** (developed in collaboration with Dr. Leonisa Ardizzone and DDC’s Coastal Resiliency Unit) in at least one YEP-alum site (to be determined). Other sites will implement DDC’s *Building the Future* curriculum.

- **Virtual Reality Curriculum:** STEAM and DDC Police/Fire Unit Director Lucy Wong are exploring the creation of educational curriculum focused on DDC Projects using virtual reality technology. The goal is to immerse underrepresented youth in a VR program that fosters interest in the potential of the technology and explores its current and potential applications in AEC industry.
 - **NYC Commitment:** NYC Economic Development Corporation and the Mayor’s Office of Media & Entertainment is working with NYU Tandon to create a state of the art VR/AR Lab with the workforce development center at CUNY. The goal of the Mayor’s Office is to position NYC as a global leader in the VR/AR Industry. Medicine and built environment are the two areas where this technology can be best utilized. The \$6 million Lab will focus on Healthcare, Education Real Estate (AEC built environment) and Entertainment industries.
 - **Application to DDC:** Numerous private and public entities are beginning to adopt the use of VR, specifically in the world of architecture, engineering, and construction. VR is now viewed as an important tool to help mitigate changes because people/client agencies will be able to view project in 3D in design stage and identify issues that would result in change orders and delays to the project. This would help construction projects avoid extensive and expensive change orders.
 - **DDC VR Program 2017:** With some assistance from a Fordham Street Foundation grant awarded to STEAM, we acquired Google Expedition VR goggles + ASUS Android Phones, a 360-degree camera, laptop, and Oculus Rift VR goggle. Coro Fellow Zach Litif, who was assigned to DDC in October, worked with Lucy Wong to test the VR equipment and developed a 360-degree video featuring DDC project Hunters Point Library, which is currently under construction. The interactive video, which can be viewed using the VR goggles, allows viewers to control the viewing direction of any given shot captured by the 360-degree camera.
 - **DDC VR 2018:** Lucy Wong will pilot a VR educational program during the HS Summer Internship Program in 2018. The pilot will consist of multiple workshop days, during which students will work in teams to produce an immersive VR experience focusing on a DDC project that can be viewed using VR goggles.
- **NYC Agency Expansion:** STEAM has had conversations with other City Agencies in an advisory capacity to share DDC’s curricula and encourage them to create subject specific STEAM curricula relevant to their agencies. In December 2017, STEAM met with representatives of NYC Department of Buildings to discuss how DDC can assist DOB in creating a high school summer program like DDC STEAM. DOB was referred to DDC by CM Vanessa Gibson during last year’s budget hearing. Their goal is to have DOB STEAM like program up and running by Summer 2018.

DDC STEAM | TESTIMONIALS

- **Mayor Bill de Blasio |** “Middle school is an essential point of development in a young person’s life where their learning experiences help mold them into future scholars. That is why I am excited to see the Department of Design and Construction working with the Department of Education, the Department of Youth and Community Development and these young New Yorkers to provide them with rich, engaging, and fun experiences, all while nurturing their passions for engineering, math, art, design and New York City.”
- **Chancellor Carmen Fariña, DOE |** “Educating our children in science and engineering are part of our strong commitment to preparing young people for successful careers, and I continue to encourage more young girls to pursue studies in math and science. I am happy to see students participating in this innovative program.”

- **Commissioner Bill Chong, DYCD** | “As proficiency in STEAM becomes more important to the futures of our young people, DYCD-funded COMPASS afterschool programs have incorporated robotics and other STEAM curriculum into their programming. The knowledge that these students bring to the Young Engineers Program highlights the value of this collaboration with DDC and DOE—an incredible opportunity that taps into the imagination and creativity of our next generation of innovators.”
- **Miguel Gamiño, Jr., New York City Chief Technology Officer** | “The Department of Design and Construction, the Department of Education and the Department of Youth and Community Development have done incredible work together to engage young New Yorkers in creating tools and models for the future of our city. Now, more than ever, our City’s youth must have fair access to educational opportunities that will allow them to participate in a modern world and build the future of tomorrow.”
- **Dr. Leonisa Ardizzone** | “The Young Engineers program is a model of STEAM education that can, and should be replicated far and wide. These young people are not just experiencing math and science in different ways, they are also learning how to problem solve like engineers, to think critically, and learn the ever-important skill of working collaboratively with a team.”
- **Council Member Daneek Miller** | “The success of the STEAM program has given our young scholars the confidence they need to enter the math and science industries of the future. These students are on their way to accomplishing much and I cannot wait to see it.”
- **Council Member Vanessa L. Gibson** | “Early exposure to STEAM studies instills a scientific curiosity in students that will serve them throughout their academic career. I am proud of our students at the Teller Avenue Campus for their participation in the Young Engineers’ Program and thank DDC for modifying the Program’s curriculum to address the real environmental health concerns we face in the Bronx. Since 2014, the Young Engineers’ Program has provided our middle school students with an innovative and engaging approach to real-life application of STEAM sciences. This middle school enrichment program would not be possible without the partnership of DYCD and DOE. I thank these agencies for coming together with the Administration to bring this invaluable opportunity for students of the Bronx.”
- **Council Member Ritchie Torres** | “Engaging younger students in the STEAM curriculum and coupling that with real-world projects surely helps to prepare them for the future. I’m impressed by what the middle school students were able to design and create during the summer, and hope they will take their experiences from the Summer Enrichment Program and use them to further advance their goals and our City.”
- **Queens Borough President Melinda Katz** | “Many young people have benefitted from the DDC STEAM Education Initiative, an invaluable program for our City to develop the next generation of engineers, architects and urban planners if we are to remain globally competitive in the 21st century. The New York City Department of Design and Construction...deserves to be commended for undertaking this important initiative for our City’s future.”
- **Monique Jarvis, LeAp Deputy Supervising Director** | “The Young Engineers' curriculum engages our eager students with exciting and relevant STEAM content while enhancing their technological literacy. By equipping our bright scholars with this 21st-century, technological language, we are inviting our students to be competitive throughout college and ready for our quickly changing marketplace.”
- **Edgar Lin, Principal of JHS 22 Jordan L. Mott** | “As a school community, our responsibility is to work together to solve all the problems that standing the way of high-level student learning. To do that, we must reclaim in our students a sense of curiosity. Curiosity leads to power and power leads to action. Nurturing our curiosity inherently empowers and emboldens our children to envision themselves as inventors, scientists, and creators, and has been proven to improve students’ engagement and achievement. Our mission as educators in the 21st Century is to find innovative ways to remove obstacles that stand in the way of our students’ learning. DDC’s Young Engineers Program has successfully met that

creative imperative. I am thrilled that DYCD and DDC have partnered to bring inventive programs like this that awaken student's minds while exposing them to STEAM fields."

- **Margaret Gorry, Mathematics Teacher IS 171, DOE Summer Stem Institute 2017** | "I really enjoyed all the activities and how involved the DDC is in incorporating STEM in schools."
- **Elmer Calvelo, Mathematics Teacher, The Young Women's Leadership School of Queens, DOE Summer Stem Institute 2017** | "I found all the activities fun and interesting and students will have the same experience. It provides multiple entry points for the students."
- **Judith Felice, Mathematics Teacher, MS 216 George J. Ryan, DOE Summer Stem Institute 2017** | "Loved it! So relevant to my teaching goals!"
- **Lyudmila Taylor, Science Teacher, PS 226 Alfred De B Mason, DOE Summer Stem Institute 2017** | "Great activities to introduce STEAM related, design and building activities into the classroom."
- **Pamela Wilson, Mathematics Teacher, Q309 Academy Of Medical Technology: A College Board School, DOE Summer Stem Institute 2017** | "I enjoyed the interdisciplinary components of the workshop. This was a great hands-on experience."
- **Mariano Arce, Science + Special Education Teacher, M.S. 126 K Magnet School of Environmental Engineering, DOE Summer Stem Institute 2017** | "The connection with NYC DDC helps students explore and align their career goals."
- **Sarah Saad, 2017 High School Summer Intern** | "Through this internship program I have gained valuable experience relating to not only the work of an architect, but a project manager, civil engineer and a structural engineer. I dealt with real projects and learned the process of how a project goes from start to completion."
- **Selena Tan, 2017 High School Summer Intern** | "I have learned a lot from my experience working with various engineers. For example, I am now familiar with DDC's role in the city and I now know different types of engineers and their roles. I have also gained experience working on AutoCAD, drawing on topographic surveys, and writing professional memos. Further, I now understand the importance of networking and teamwork in all career fields."
- **Jonathan Watson Nelson, 2015-2016 Young Engineer** | "I like the hands-on activities because I'm a kinesthetic learner."
- **Wilfredo Fermaintt, 2015 – 2016 Young Engineer** | "Thank you DDC for instilling in me a desire to pursue a career in Architecture, Engineering and Construction and guiding me to a CTE school that can help me achieve that goal."

DDC STEAM | PARTICIPANT STORY

WILMER

2017 High School Intern
Assigned Division: Public Buildings

I currently attend the High School of World Cultures, a small school on the James Monroe Campus in the Bronx. During my participation in the DDC High School Summer Internship Program, I was introduced to the complex world of architecture, engineering, and construction. I was assigned to the Build It Back Program within the Public Buildings Division, where I was introduced to the design and construction process necessary for sustainable home rehabilitation. My mentors invited me to join them on site visits to various NYC neighborhoods impacted by Hurricane Sandy to learn about how the Build It Back program revitalizes damaged homes and helps to promote economic stability in the community. In order to adapt to the changing environment and to provide for protection from future storms, damaged homes are either elevated or rebuilt to comply with flood elevations standards. I learned how home foundations are reinforced and set to industry standards that include resiliency improvements. In addition, the STEAM Initiatives Division prepared many workshops where I was able to gain valuable knowledge and new insight from the experience of S.T.E.A.M professionals. I also had the opportunity to network with many S.T.E.A.M professionals at DDC, and learn foundational 3D design software and model-making skills. This internship was a wonderful learning experience and has reinforced my passion for the field of engineering. So much so that I have decided to apply to City College to pursue a career in either electrical or civil engineering.

KEAIRA

2017 High School Intern
Assigned Division: ACCO

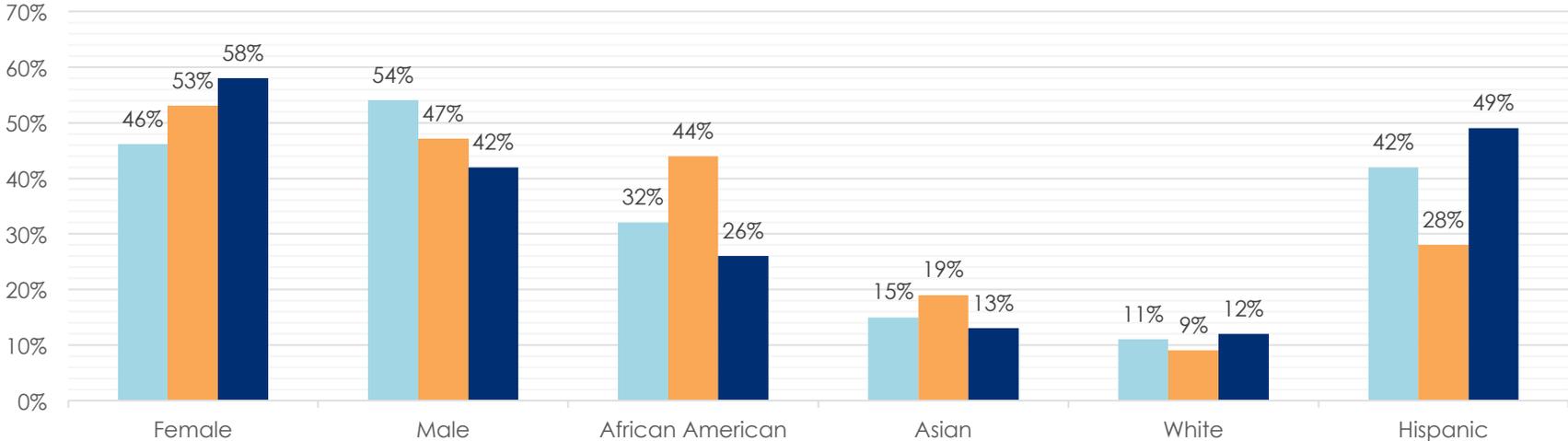
As a student, there are many daily, time consuming, tasks that I must complete, however my free time is usually spent reading up on new and upcoming technology, fashion, or music trends. It is important to keep up with today's culture because there are many significant factors affecting the direction of this generation. Recently, I've been working to create a positive platform to inspire and encourage my peers. Social media is a source of all kinds of energy and I want to create content that will be positively influencing. I am passionate about STEAM because I believe that it is the outlet to an exceptional future. There are so many opportunities in this ever-expanding field. Many are unaware, such as I was, of the countless career choices, rewarding accomplishments, and how small contributions can make a huge difference in a large project or a breakthrough in future innovations. I enjoy STEAM because problem solving is important for growth. My favorite subject is math and breaking down numbers or solving issues is a skill I enjoy building upon. Also, I took a coding course at Hofstra University and it was a fulfilling experience. When learning a new computer language there are endless routes that one can take to reach a preferred outcome. During the DDC High School Summer Internship Program I was assigned to the ACCO unit, working under Ms. Lorraine Holley. The whole contract team was extremely patient, compassionate and had endless information to share with me. I can now say that I know most of the ins and outs of the bidding process. I was able to attend a bid and a pre-bid conference. I am forever indebted to all who have made this internship a memorable one. This internship was a very eye opening experience that gave me the opportunity to expand my interests into other career paths.

2017 CUMALITIVE STATISTICS

CATEGORY		TOTAL NUMBER
Total Number of STEAM Programs		8
Programs	Young Engineers Program (Fall & Spring semester 6-8 weeks)	
	High School Summer Internship Program (Summer 6 weeks)	
	DYCD Ladders for Leaders College Summer Program (Summer 6 weeks)	
	College Summer Internship Program (Summer 10 weeks)	
	Middle School Summer Enrichment Program (Summer 4-6 weeks)	
	Opportunity Academy (Yearlong program)	
	ACE Mentor Program (After-School program, yearlong)	
	Town & Gown (Yearlong program)	
Total Number of Events Implemented & Attended (1 Day Events)		24
Total Number of Students Who Participated in STEAM Programming		888
Demographics Percentage (Perceived)	Female	28%
	Male	42%
	African American	26%
	Asian	13%
	White	12%
	Hispanic	49%
Number of Elementary School Participants		25
Number of Middle School Participants		548
Number of High School Participants		247
Number of College Participants		40
Total Number of Professional Development Participants		49

STUDENT DEMOGRAPHICS *(Perceived)*

2015 2016 2017



STUDENT GRADE LEVEL

2015 2016 2017

