



The Roger Lehecka Double Discovery Center

Getting community youth to, through, and beyond college



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From feeling uninspired as a middle school student to enrolling at DDC and unlocking a wealth of opportunities!

As a member of Class of 2024, you will be a participant in an academic community with a remarkable array of intellectual and personal talents said my admission letter from Columbia University's Fu Foundation School of Engineering and Applied Science. Quite a

change from my middle school years when I thought school was not for me, homework was optional and math and science were of no interest whatsoever!

We hope you will share your joy and excitement with the faculty at your school who helped you reach this happy day, the letter added. I am indeed grateful for my high-school teachers who gave me a first-rate education. However, I am even more grateful to DDC for the four years of encouragement and coaching – starting when I was still in middle school. Without them, I might not even have made it to the Manhattan Center for Science and Mathematics high school, one of the highest performing schools in New York, which prepared me for Columbia’s Fu Foundation School of Engineering and Applied Science!

I was 14 when I first came to DDC. I did not believe in myself and thought Ivy League institutions were inaccessible to me – reserved only for the elite and the smartest of the smart. From day one, DDC counselors helped me to imagine myself on an Ivy League campus and showed me how to make this an attainable goal. They made me believe in the goal. They encouraged me, gave me the motivation to do well in school and told me again and again that if I worked hard, I would get good grades. I took their advice and soon, getting “A’s” became my reality.

Through DDC, I enrolled in Relevé, a 3-day program hosted by Columbia University's Sabor Latin Dance Troupe that wants to motivate students to go to college. It is the instructor at the time who encouraged me to apply to the Manhattan Center for Science and Mathematics and their advanced scientific research program. In a span of one year, I went from a very uninspiring middle school to one of the best public high schools in the City.

At Manhattan Center, I was immersed in advanced programs that introduced me to physical theories – string theory, quantum physics, special relativity – and this is where I discovered my passion for science! The DDC classes – Calculus, Physics, English – that I took in my junior year made such a difference. For example, for Advanced Placement (AP) Calculus, I wanted to take the BC exam, the highest level, but I was at the AB level. My DDC instructors helped me learn the AB material faster, so that I would have enough time to study for the BC exam. In the end, I scored a 5 on the AP Calculus BC exam, which is the highest score!

One of my proudest achievements to date is building and launching a rocket for the Team American Rocket Challenge at City College of the City University of New York (CCNY). The Team American Rocket Challenge is an annual American model rocketry competition sponsored by the Aerospace Industries Association and the National Association of Rocketry for students across grades 6 to 12.

I always wondered how rockets work – how do scientists determine the amount of fuel needed and the height it will reach? Now I know! I learned how to model rockets by teaching myself to mold fiberglass and then I taught my team. Together we modeled and molded fiberglass until the rocket seemed flawless. For six months, I worked at CCNY, from sunrise to sunset, and nothing made me happier! Through passion, ingenuity, and curiosity, we built a working rocket from scratch. I would call that an extraordinary achievement!

DDC played a crucial role in introducing me to these wonderful new experiences. For me, the DDC formula for college success included more than tutoring and encouragement.

- DDC teaches students how to develop their “personal brand.” I developed self-confidence and learned time management and people skills. I also learned how to study, set goals, and conduct myself at an interview. These are valuable life-long skills.
- DDC classes are small, 10 – 15 students vs. 30 students at some public schools. It is much easier to ask questions and get individualized coaching when there are fewer students in a class. This helped a lot when I took a physics course through DDC. I was never lost in class at my school because I had previewed the material at DDC.
- DDC introduces students to many different fields so that we can find out what we might want to study. I took many classes. It was like trial and error, but it set me on a path to a

field I enjoy and what I expect will be a fulfilling career.

- DDC opens door to many opportunities. In my case, DDC helps me to apply to QuestBridge, a nonprofit platform that selects top low-income students and connects them with the nation's best colleges. QuestBridge forwarded my college application to MIT, Princeton and Columbia; and Columbia won!

Four years ago, DDC created an environment of success for me. I received comprehensive and effective coaching, got introduced to many different fields, and uncovered that part of me that loves science. Along the way, I made many friends – students like me who want to learn, go to college and lead fulfilling and productive lives. I could not have done as well without DDC!

At DDC, We Bridge the STEM Divide

These last three decades have seen many life-altering inventions – from the Internet (1990) to the iPhone (2007) to self-driving cars (2012). The future is here, and it demands a public skilled in Science, Technology, Engineering, and Math (STEM). Unfortunately, too few young people are prepared to meet the country's need for STEM workers: 78% of high school graduates today do not meet benchmark readiness for one or more college courses in mathematics and science. About 2.4 million STEM jobs went unfilled during 2018. Blacks and Latinos, however, are particularly underrepresented in effective STEM education and careers. This means they are missing out on jobs that are well paid and in high demand. In 2015, STEM workers earned 29% more than their non-STEM counterparts. It also means that the country is missing out on badly needed intellectual capital. If we do not prepare enough future engineers and scientists, we will forfeit our leadership position in high-tech. A 2010 National Academies report warned that low levels of science achievement has the potential to derail the nation's long-term global competitiveness.

According to a 2016 study published in *Educational Researcher*, the science achievement gap between racial, ethnic and socio-economic groups starts as early as kindergarten and continues throughout the elementary and middle grades. Black and Latino students overwhelmingly attend high-poverty and under-resourced schools with limited access to computer science classes, hands-on science activities and labs with state-of-the-art equipment. The result is a huge disparity in the STEM pipeline. The 2017 federal report *Women, Minorities, and Persons with Disabilities in Science and Engineering* indicated that in 2015, less than 5% of STEM workers were either Black or Latino men or women while 49% and 18% of white men and women respectively worked in STEM.

In response to this challenge, DDC is working to bridge the STEM divide by investing in STEM classes and internships for its students. We partner with Columbia University's Zuckerman Institute, the Fu Foundation School of Engineering and Applied Science, and Lamont-Doherty Earth Observatory as well as with CodeNation to immerse students in courses that build their STEM knowledge, develop their critical thinking and scientific inquiry skills and cultivate their applied science capacities so that they are equipped to innovatively solve real-world problems. The courses, mostly taught by Columbia University graduate students or postdocs, are designed to introduce them to the excitement that comes with inquiry and discovery and to help them uncover their creativity and sense of innovation. Our students also strengthen their math skills, which, in the short-term, prepares them for the NYS Regents and Advanced Placement exams, and ultimately college.

We expose our students to STEM work as early as 8th grade through "Discover Science," which helps them to unearth their passion for science. This hands-on program exposes them to the mathematical patterns in nature and the scientific method, from hypothesis to data gathering to conclusion. The classes include lab-based scientific experiments at Columbia

University's Zuckerman Institute Education Lab and are led by a Ph.D. in Genetics from Harvard.

Throughout 9th to 12th grade, our students continue their STEM education. Below is a list of the offerings for Spring 2020:

- **Mathematics For Physics** – Students strengthen their skills in and knowledge of proportional reasoning, equation solving, and graph analysis, which is foundational for the higher-level math and science classes that they will encounter in college.
- **Algebra** – Students develop a rigorous understanding of algebraic skills, knowledge and functions.
- **Calculus** – The course builds a bridge from high school/lower-division mathematics to upper-division mathematics.
- **Chemistry** – Students explore the basic laws of chemistry, covering the common elements of the periodic table, their structure, interactions, and energy relationships.
- **Living Environment** – Students get a broad general understanding of the fundamental principles of biology, including the study of life, maintenance of plants and animals, reproduction and development, and genetics.
- **So You Want To Be An Engineer?** – In this class, students build a career-ready set of skills and professional connections/resources that prepares them for success in the STEM field.

DDC's efforts to build a strong STEM foundation for our students do not end with these classes during the academic year. They continue through several STEM internships offered during the summer through DDC's collaboration with other departments across Columbia University and nonprofit organizations within the community:

- **Columbia University Lamont-Doherty Research** – This six-week summer program of field and laboratory science offers students the opportunity to work on ecology and environment projects with field research teams that include college students, science teachers, and research scientists.
- **HK Maker Lab** – This is an intensive six-week summer program for high school students, developed in partnership with Columbia University's Fu Foundation School of Engineering and Applied Science. It teaches students the foundations of engineering design. Students work in teams on a specific global health problem, build and test a related biomedical device, and design the business plan that they present at a pitch event attended by leading executives from the biomedical community.
- **Hypothekids STEAM Up!** – This three-week program uses project-based learning approach to help middle school students tap into their creativity as they explore sustainability, engineering, and innovation and apply principles of biology, chemistry, and environmental sciences to real world problems.
- **NY Bioforce** – This is an intensive biotechnology lab program that provides high school students with over 100 hours of biomedical research training and that leads to paid internships in labs and companies from around New York, including Columbia University and Weill Cornell Medicine.
- **BRAINYAC** (Brain Research Apprenticeships in New York at Columbia) – This is a 7-week immersive summer research experience at the Columbia's Zuckerman Institute, a state-of-the-art facility dedicated to the study of the brain and the mind. Students work full time in the Institute's lab on a research project of their neuroscientist mentor.

DDC's STEM learning opportunities spark students' interest in science, technology, engineering and math and effectively prepare them to enter the STEM pipeline that begins with college and can lead to well-paying jobs within a critical professional field. Columbia University Fu Foundation School of Engineering and Applied Science, Rensselaer Polytechnic Institute, NYC Institute of Technology, and Wentworth Institute of Technology are a few of the research institutions that have accepted DDC students.

DDC is making a difference!

Partner with us to offer the gift of education! To help fund our programs and expand our outreach, click here: "[Change a Life](#)"

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We want to hear from you!**

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