



The Roger Lehecka Double Discovery Center

Getting community youth to, through, and beyond college



The Science of Composting for a Greener New York City

In this August 2021 Issue:

1. Spotlight on:

- **Destiny Howell, DDC '19, Hunter College '23**, will attend the NASA Lucy Student Pipeline Accelerator and Competency Enabler (L'SPACE) Mission Concept

Academy this fall. The program engages science and engineering students in meaningful, mentor-based, experiential STEM workforce preparation to build a highly-qualified talent pool for NASA's workforce needs. Destiny is a junior majoring in physics. She looks forward to studying the sun, the moon and the stars as an astrophysicist.

Congratulations, Destiny!

2. DDC's Growing Partnership with Columbia University's Zuckerman Institute

- ***Composting: Reduce Waste and Improve the Environment - DDCamp and BioBus, a Zuckerman Institute Partner***
Final Project by Hallelujah G., DDC '2025
- ***Neuroscience and Bioethics - The Intersection of Consent and Addiction - Brainyac/Zuckerman Institute***
Final project by Paola F., DDC '22: *Can an addicted person give voluntary consent to being administered their drug of addiction?*

3. Reflecting on Going Back to School!

- By Nasrin S. DDC '22

Composting: Reduce Waste and Improve the Environment DDCamp Final Project by Hallelujah G., DDC '2025

I will never look at worms the same way again, says Hallelujah G., DDC '2025. I now know how important they are for the environment! I took this class because it sounded different and I enjoyed it so much that it is now my favorite of the DDCamp summer program! We each got a USB-powered microscope to hook up to a computer. It was fun to see so many things up close, she adds. We also received a colony of compost worms, a compost container with dirt, and we learned about bacteria, fungi, organic matter, and how compost worms bring nutrients to the surface of the soil to help plants and trees grow.

Through a partnership between DDC and BioBus, the class was part of the academic offerings of our inaugural launch of the DDCamp summer program for middle school students. It was led by BioBus scientists Christine Marizzi, PhD in Genetics, University of Vienna, Austria, and Robert Frawley, PhD in Physiology, Biophysics & Systems Bio, Weill Cornell Medical College. *We did a lot of hands-on activities to introduce students to the excitement of science!* says Christine Marizzi. *We walked them through all the material and asked them guided questions such as "How does the soil come about" to promote critical thinking. We highlighted a holistic view of the world by bringing up many science topics, from microbiology to anatomy to the environment. They learned how to observe and categorize the natural world and they were excited to see the invisible becoming visible with the microscope.*

Why a DDCamp class on the science of composting in the heart of New York City?

According to the NYC Department of Sanitation, one third of what New Yorkers throw away is food scraps and yard wastes that end up overflowing in landfills. These organic wastes could be used to create compost and renewable energy. The City offers residents several recycling options, including drop-off and curbside composting, all detailed here: <https://www1.nyc.gov/assets/dsny/site/services/food-scrap-and-yard-waste-page>.

Composting is about building nutrient-rich soil, reducing and recycling garbage, and improving the environment, says Robert Frawley. The decomposition of food scraps and yard wastes releases trapped nutrients, which then enrich soil. Worms aerate the soil, accelerate decomposition, and carry the nutrients from the surface to lower levels.

For the final project, each student built a worm farm, complete with compost bin and food wastes, and cultivated the right environment to sustain it. *They created a whole ecosystem, says Christine, a smaller version of what happens to the soil in Central Park for example. And Hallelujah adds, I took good care of my worm farm and I kept track of the whole operation with my microscope. It was really neat!*

This DDCamp class sparked my daughter's interest in science, says Hallelujah's mother, Ms. Veresyuk. The DDC program has boosted her self-confidence and increased her creativity and attention to details. She is looking forward to sharing pictures of her final project with her science teacher at school.

These students are super excited about the natural world. They are very inquisitive and so grateful for the opportunity to speak with scientists, says Christine, they think scientists are cool! They do not see themselves as researchers, and yet, they use the microscope, they do observations and they write them down – this is what researchers do! They are really smart kids, they have a bright future.

Neuroscience and Bioethics: The Intersection of Consent and Addiction

Can an addicted person give voluntary consent to being administered their drug of addiction? Final project by Paola F., DDC '22

We did so many hands-on brain science activities this summer at the Brainyac internship! says Paola F. DDC '22. We dissected a brain to understand the structures and functions. We reviewed and analyzed pages and pages of scientific literature. And, we each selected a topic for a research paper, developed the arguments and presented the results to a panel of the Zuckerman Institute's researchers. I learned so much and I have now decided to pursue a career in the scientific field!

Brainyac is an annual intensive lab internship for 10th and 11th graders. It is organized by Columbia's Zuckerman Institute and the objective is to prepare today's youth to become tomorrow's scientists. The Institute, located in a state-of-the-art facility and dedicated to the study of the brain and the mind, counts Nobel laureates Richard Axel, MD and Eric Kandel, MD among its investigators. Students are

introduced to the essential skills for a career in the science field and develop those skills through work on their own research project. Their efforts are guided by a Columbia neuroscientist who serves as a mentor.

Andrew Tyler Richmond, Ph.D. candidate at Columbia University and Paola's mentor, helped her review current issues in the field of neuroethics to select the topic of her research project: [Consent and Addiction](#). *To treat or research addiction we need to understand how the drug affects the individual, both before and after the addiction. To do that, we have to give individuals the very drug they are addicted to in order to measure the effect, explains Andrew. We do ask them for their consent. However, we know that being addicted means that the individual feels a compulsion to use that drug. If you feel compelled to do something, you are not doing it voluntarily, so how ethical is this research or treatment?*

Paola reviewed the relevant scientific literature and weighed the two addiction models: the moral model where addiction is voluntary and the brain disease model where addiction is a disease that impairs cognitive functions. *I concluded that addiction interferes with free choice by affecting the addict's ability for self-governance – the control or rule over oneself. Because this ability varies with each individual, I think it is safe to say that addicted individuals may not have the full capacity to give voluntary consent. Andrew adds, we need a deeper understanding of addiction and consent to figure out how to conduct addiction research and treatment fairly and responsibly.*

I am very grateful that DDC opened the door to help me access this extraordinary internship, says Paola, it gave me a new perspective on science. I gained observational skills and I learned how to analyze and interpret research papers – some of them were 30 pages-long! This wonderful experience has impacted my choice of majors. I am finalizing my college list and I am taking a closer look at the STEM and science departments at each institution. I am now considering neuroscience or biology.

Reflecting on Going Back To School!

By Nasrin S., DDC' 22

I am both excited and nervous about going back to school. I have not seen most of my friends and classmates for over a year and it is nerve-wracking to think about meeting them in person again. Quarantine took a huge toll. Most of us became a "new" version of ourselves. New relationships developed while others faded away.

In some ways, it was easier being virtual. I did not need to wake up an hour and a half before class to get ready. I just needed ten minutes to look presentable on Zoom. I could sleep-in more.

I miss the interaction with friends though, and the buzz and excitement in the halls and the classrooms of my school and DDC. I miss getting hugs in between classes and discussing plans for after school. It is more fun to attend classes in person. I can watch my classmates' reactions and guess their thoughts.

This is my last year in high school, and it is scary because it means I'm almost an adult and will soon go to college. This is a huge milestone in my life. The world feels like it is in the palms of my hands!

I look forward to being with my friends, teachers, and classmates, I know this year will be fun and exciting!

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