



Case Study

Summer STEM / Minecraft: Education Edition

A partnership between The Fund for Public Schools, NYCDOE, and Microsoft

January 2017



“During the school year, I am a middle school music teacher. I signed up to teach in Summer STEM to grow as a teacher in an area that I think is very important now and will be even more important to the future of education. I use a lot of technology within my music program to modify my curriculum to the needs of my students. I truly believe that students need more teacher-facilitated learning, where they are allowed to fail safely and grow from their mistakes.” – Christy Emmond, Global Technology Preparatory

Christy Emmond and 17 other NYC public school art teachers were part of the 2016 Summer STEM program. They leveraged the **Minecraft: Education Edition** arts enrichment component alongside 217 other teachers who taught STEM-focused classes such as robotics and coding. In preparation, Christy and her peers received three days of professional learning on both content and pedagogy, which included sample lesson plans.

“Overall, I felt fairly prepared for my curriculum this summer, but I also learned Minecraft very quickly and spent my own time in the mornings and lunches exploring the program and learning more.”

Introduction

In 2015, the NYC Department of Education (DOE), with early support from Microsoft, launched a pilot learning program called Summer STEM. Participating students showed a significant improvement in science interest compared with the general population, as measured by Harvard Medical School's Education, Afterschool & Resiliency (PEAR) Institute. The pilot also spurred continued partnership with the Boston Museum of Science's Engineering is Elementary (EIE) curriculum, which was expanded in 2016 as STEM enrichment for all students in mandated summer school.

In early 2016, The Fund for Public Schools and the DOE partnered again with Microsoft in a collaboration to integrate Minecraft: Education Edition into the DOE's Summer STEM program for NYC students. Minecraft is a three-dimensional digital game in which users employ building blocks to create unique, personalized worlds based on available resources. In June 2016, Microsoft released the beta version of Minecraft: Education Edition, which was developed for easy classroom collaboration and included new in-game teaching tools. The Education Edition allowed Summer STEM participants to utilize valuable skills: imagination and creative design; problem-solving; and collaboration with classmates on shared projects.

In addition to hands-on learning about engineering, robotics, and coding, students engaged with an arts curriculum that allowed them to build sculpture gardens and rollercoasters using the software. The result was an energetic and fun learning environment full of creativity, problem-solving, and collaboration.

As one branch of the DOE's larger Summer in the City program, Summer STEM 2016 increased student exposure to STEM subjects for nearly 3,000 students in grades 2-10 over the course of 22 days, across 10 sites in all five boroughs. Summer STEM was an opportunity to shift the mindset around the purpose of summer learning from remediation to enrichment, as these students were not mandated to attend summer school. Instead, students were selected by lottery as part of an effort to increase the participation of both female and Renewal School students.¹

In addition to students learning STEM subjects through project-based learning including an innovative arts curriculum, they visited NYC cultural institutions, participated in social-emotional learning, and took health and wellness classes. The DOE ensured high-quality instruction by partnering with several organizations dedicated to providing hands-on, engaging learning experiences for students. In particular, Microsoft played an important role by contributing the Minecraft: Education Edition software, with additional features that align with the Summer STEM arts curriculum for students in elementary, middle, and high school.

¹ Renewal Schools receive additional DOE support and are accountable for rapid improvement.

Minecraft: Education Edition in the Summer STEM classroom

In a typical sixth-grade art class in the Summer STEM program, a visitor would see students sitting in groups of two or three in front of their tablets, engaged in problem-solving around the height, speed, and design of the rollercoasters they built using Minecraft: Education Edition. Not just a video game, Minecraft was helping students refine their math and design skills. The students collaborated by working on different elements of the rollercoaster so they could complete the project on-time. They each explained the finished product to their classmates by giving a presentation in front of the class, including what elements of the project did not go as planned. Their teacher reflected, "I wanted to make them comfortable sharing those moments to realize those failures and mistakes made their final product. That was probably my biggest lesson this summer as a teacher: I need to allow my students to fail more and grow more."

Training

Summer STEM began with professional learning for teachers on both the summer curriculum content and pedagogy that included lesson plans, activities, and weekly challenges. The three-day capacity-building session took place in late June, with more than 200 teachers learning together in preparation for delivering high-quality instruction. With innovative curricula and software covering math, engineering, robotics, and computer science, this training not only prepared the teachers to guide the students in STEM lessons during the summer, but also gave them materials and curriculum to bring back to their classrooms for use during the school year.

In addition, several Microsoft staff members led by Chuck Luey, Account Executive, US Education partnered with the DOE STEM Department to include Minecraft: Education Edition as part of the Summer STEM experience. Microsoft employees assisted with preparation for the teacher professional learning by installing Minecraft: Education Edition onto 250 Microsoft Surface tablets which were loaned to the program over the summer. As further support for Summer STEM, Mr. Luey recommended Mark Grundel, who runs the popular weekly [#MinecraftEDU](#) twitter chat, as a consultant to support the integration of Minecraft: Education Edition. Mr. Grundel collaborated with the curricular partner Institute of Play to deliver professional learning sessions to art teachers as they prepared to facilitate the arts curriculum. Mr. Grundel proved to be a helpful resource to the DOE STEM Department as a thought partner in developing additional professional learning opportunities for NYCDOE teachers.

This key capacity-building for teachers prepared them to educate students in the Summer STEM program in a wide variety of STEM subjects, including the Minecraft: Education Edition arts curriculum.





Impact

The Summer STEM program was successful on multiple levels: it created opportunities for collaborative learning and increased students' interest in science. Students attended Summer STEM in July and August, with art class 2-3 times per week. Their art projects using Minecraft: Education Edition ranged from self-portraits and sculpture gardens for the elementary school students to building rollercoasters and historic landmarks for middle and high school students.

A few key factors were critical to the success of the program, including:

- Alignment to the Summer STEM goal of providing students with access to high-quality STEM education, a necessity for college and career preparedness;
- Establishment of buy-in from all parties, including DOE leadership;
- Collaboration of several stakeholders, from recruiting teachers to finding sites to implementing the student lottery process; and
- External support and private investment that enabled flexible and nimble planning for Summer STEM.

Summer STEM art teachers using Minecraft: Education Edition gave overwhelmingly enthusiastic feedback. One teacher noted, "Minecraft: Education Edition is an amazing way to engage student learning through technology in a positive way." Another teacher described how her students expanded their scope of knowledge: "I think this program has changed the way my students and I view Minecraft and other types of computer games. By the end of the program, students realized that they can use art concepts like representational and nonrepresentational art and apply that knowledge to create artworks with Minecraft."

While Summer STEM was successful for many reasons, a few challenges emerged as well, providing valuable lessons for future summer programming. In some instances, sites did not have adequate planning time in spring 2016 to ensure a smooth program beginning. There were also logistical challenges around ensuring that all devices were delivered to each site in addition to making sure that all devices had software updates. These challenges will be taken into consideration in planning ahead for Summer STEM in 2017.

Results for our Students

- 2,685 NYC public school students in grades 2 – 10.
- Students in grades 2-3 reported significantly higher STEM interest at the end of the program.
- All students reported significantly higher ratings of STEM interest items compared with students of the same age nationally.

Sustainability

Incorporating Minecraft: Education Edition into the Summer STEM curriculum has had several positive lasting effects. In addition to learning how to effectively deliver innovative curricula during the summer, teachers can take their training, along with any related materials, back to their classrooms to use during the regular school year, exposing even more students to this highly engaged style of learning. Students benefitted from learning the software as well, participating in the design process using both collaboration and peer feedback, and developing valuable skills that will prepare them for the 21st century workplace.

Minecraft: Education Edition inspired DOE staff to explore additional out-of-the-box ways to support teachers and students with game play exploration. Teachers, too, expressed interest in continuing to use Minecraft: Education Edition during the school year. Specifically, one teacher noted, “I would like to introduce Minecraft: Education Edition art to the fifth grade students at my school.”

To expand teachers’ access to learning how to integrate this software into the classroom, the DOE offered a two-day Minecraft: Education Edition professional development session for 23 teachers in Fall 2016, with additional plans to offer more sessions in Spring 2017. The STEM Department offered these professional learning opportunities based on the resounding positive feedback from teachers and students regarding the experience. These new sessions attracted high interest from teachers around NYC who want to engage their students with collaborative projects using this software. It is clear that this partnership will have critical, lasting impact on New York City’s summer learning opportunities and beyond for both teachers and students.

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About The Fund for Public Schools



The Fund for Public Schools (FPS) has consistently and rigorously dedicated itself to supporting New York City’s public schools since 1982. FPS supports some of the most innovative programs in K-12 education at the largest school district in the country, with 1.1M students in approximately 1,800 schools. Partnerships between FPS and the philanthropic community enable the NYC Department of Education to pilot innovative projects; accelerate promising, outcome-driven initiatives; and respond quickly and strategically to emerging needs across the system. To learn more about The Fund, or to join its growing list of supporters, visit www.fundforpublicschools.org.