Imagine Science:

The Power of Collaboration in Challenging Times

A special update on COVID-19 response and recovery

Winter 2021

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Imagine Science: the Power of Collaboration

Careers in mathematics, science, engineering, and technology are among the fastest growing and most rewarding professions in today's economy. But for many of the nation's underserved youth, these opportunities can seem far out of reach.

In 2015, four of the nation's largest youth-serving organizations— Boys & Girls Clubs of America, Girls Inc., the National 4-H Council, and the YMCA of the USA—joined forces to launch Imagine Science. Their mission is to build excitement and confidence in young people from low-income communities in pursuing STEM careers. To date, partners working in eleven communities nationwide have brought Imagine Science to over 30,000 youth.

The effort is getting results— 71 percent of participating students showed an increase in their enthusiasm for STEM learning across 2019 - 2020, according to surveys, and 54 percent said they were interested in pursuing a STEM career compared to a national benchmark of 46 percent.

Getting kids excited about STEM takes high-quality programs, and the secret to delivering them, partners say, is a high and often unprecedented level of collaboration across organizations. **"It's more brains, more ideas, more innovation, more scale and impact,"** explained Dominique Jones, executive director of Boys & Girls Clubs of Harlem.

COVID-19 posed the most significant challenge to Imagine Science operating organizations that their leadership and staff had faced in their lifetimes. How they prevailed is a testament to the conviction of their independent missions, flexibility and capacity. How they collaborated is a story of community resilience and the strength of the Imagine Science delivery strategy.

Imagine Science: Pandemic Response

Just days after the COVID-19 pandemic ground New York City to a halt in March 2020, staff at the Boys and Girls Club of Harlem were on the phone with their Imagine Science partners. Their much-anticipated summer program, with its computer science and social activism curriculum, would have to be rethought. More urgently, out-of-school students needed learning activities, social and emotional support, and information about the pandemic—now.

Working together, the partners—which included three Boys and Girls Clubs and the 4-H program run by Cornell University Cooperative Extension in New York City, designed a series simple science lessons and activities aimed at preventing COVID-19. The Boys and Girls Clubs delivered these via video conferencing and also made them available to families online. Topics included the science behind how soap works to fight germs and how social distancing prevents illness.

"We wanted to make programming relevant to the kids' lives," explained Chaelee Dalton, STEM Programming specialist at the Boys and Girls Club of Harlem. "One amazing thing about the Imagine Science curriculum and collaboration is there's so much room to change and adapt the curriculum to what's relevant."

In the year since the pandemic hit, Imagine Science partners have found innovative ways to continue delivering high-quality STEM learning to students in underserved communities. While enrollment declined, partners discovered they were able to serve 4,100 students in 2020, far more than they had anticipated in the early days of the pandemic. And student outcomes remained strong. For instance, more than 82 percent of participating 4th to 8th-grade students surveyed in 2020 reported that Imagine Science increased their interest in STEM careers.

Collaboration continued to be the key to Imagine Science's success, say staff at partnering sites nationwide. In New York City, 4-H provided the three Boys and Girls Clubs with training on how to support the mental health of students and staff during the COVID-19 crisis, and also on how to adapt STEM lessons to a virtual format.

"The world of teaching virtually was new to us," said Justine Robinson, academic programs manager at the Boys and Girls Club of Harlem. "4-H was extremely helpful to us. That's why we were able to respond so quickly and put out resources for our families—it was because of that support."

Imagine Science Reimagined

Every Imagine Science site needed to figure out new ways to deliver programming during the pandemic, whether the model was virtual, in-person with safety precautions, or hybrid.

Indianapolis pursued a hybrid model. Prior to the pandemic, Indiana 4-H Purdue Extension trained older teens to lead youth development programs, including Imagine Science at YMCAs and Boys and Girls Clubs in Indianapolis.

The 4-H Teens as Teachers program provides teens from underserved communities a summer job, leadership experience, and a chance to learn both academic content and pedagogy, explained Xiomara Diaz-Vargas, extension specialist. Another benefit: younger students were often more eager to learn from older peers than adults, she found. "It's inspirational to see someone eight years older than you leading your program."

While Indianapolis YMCA and Boys and Girls Clubs continued to offer in-person programming last summer, safety precautions prevented visits from Teens as Teachers.

In response, Diaz-Vargas got to work on a redesigned program. She provided teens with templates to write their own Imagine Science video scripts and trained them on presentation, filming, and video editing. She searched the internet for short videos relevant to each lesson that built knowledge of specific STEM careers, such as aerospace engineer or entomologist.

Then, for YMCA and Boys and Girls Club staff who would now teach the Imagine Science program in person, she provided remote training and curriculum guides with discussion questions and a debrief for each lesson's end. And finally, she created a system for assembling and delivering more than 500 individual kits weekly with supplies for hands-on STEM activities. (Her college-aged kids got drafted to help assemble them in her backyard.)

“For us, it was fantastic,” said Burt Beck, director of community programs at the Boys & Girls Clubs of Indianapolis, about the redesigned Imagine Science program at his clubs. Through YouTube videos, the teen teachers delivered the material enthusiastically with places for facilitators to pause and lead discussion, he said. The activities—which included building structures with toothpicks connected by gumdrops to learn engineering principles—were such a hit with 3rd to 6th graders targeted for the summer program, that some 7th and 8th-graders at the club wanted in on them, too, he said. “The curriculum was just fun.”

Challenge and Opportunity

The logistics of delivering programming during the pandemic—whether virtual or in person—were challenging, Imagine Science partners said. Learning to do so effectively, they agreed, took much trial-and-error. Because student attendance was less consistent, some partners found they needed to design lessons that could be completed in a single day. Delivering lessons via videoconference often presented teaching and technical challenges to overcome.

Yet remote learning presented new opportunities, too. Many sites found that it allowed them to reach new audiences. In Houston, 4-H staff was able to increase the number of Boys and Girls Clubs and YMCA programs they served each week from 4 to 11. In Omaha, the Imagine Science program reached students almost as far as the Wyoming border.

“The kids from western Nebraska, they were so happy,” said Mirissa Scholting of the University of Nebraska-Lincoln Extension 4-H. “They said, ‘Can you offer this to us again? Can we do it again?’”

In Weld Co., Colorado, 4-H put together a series of Imagine Science kits on kinetic, potential, and solar energy that kids could do at home, accompanied by online videos. Parent could pick them up weekly at a local museum, curbside.

“First go around, we made 40,” said Patrick Pulis, extension program associate for Colorado State University Extension, Weld County 4-H. Projects included a drag racer made from rubber bands and coffee cups and a card board solar oven.

Demand grew to 130 a week. Then Boys and Girls Club of Weld County, which will become an official Imagine Science partner next fall, agreed to add to distribute kits along with the program materials and meals it was delivering to the homes of students eligible for free-and-reduced price lunch. That raised the weekly total to 500, Pullis reported—well-above their pre-pandemic reach.

The pandemic itself created a STEM learning opportunity. At the invitation of an external partner, Imagine Science’s national team organized training to run a multi-week data science program for kids featuring a novel, *The Case of the COVID Crisis*. In each chapter, a group of teens travels to a different time period to learn about a new pandemic. With each chapter comes an activity using an online platform to create charts and graphs, and analyze the results like epidemiologists.

Dalton of the Harlem Boys and Girls Club, one of six sites that piloted the book last summer, said that her students were fascinated by the content, and the opportunity to compare it to their own experiences. And Imagine Science program leaders at the trainings were eager to learn from each other. “We were sending each other resources, like interesting data around racial disparities with COVID and how to best discuss those with our students.”

For one resourceful Imagine Science team, pandemic challenges sparked a new fundraising idea. In Dallas, the pandemic prevented the YMCA from being able to hire summer staff with a STEM background—typically teachers and college students—and train them to lead Imagine Science at YMCA sites, Boys and Girls Clubs, and other summer camps.

Because each participating site would need to use its own staff to lead Imagine Science, YMCA and 4-H needed to redesign the Imagine Science curriculum so that those without a STEM background could teach it. At the same time, they wanted to retain the program’s intellectual rigor, such as the engineering design process that requires students to define a problem and identify potential solutions to test, evaluate using data, and revise.

Two units were rolled out last summer, and more are on the way, said Katherine Steffey-Bernstein, project manager at the YMCA of Metropolitan Dallas. Once the curriculum is completed and refined, the partners anticipate selling it to school districts or large afterschool programs, she explained. “That will extend our reach while helping our own Imagine Science program with long-term sustainability.”