Children's Environmental Literacy Foundation

CASE STUDY

THE CHAPIN SCHOOL

INVESTIGATION AND ACTIVISM, BRIDGING REMOTE LEARNING

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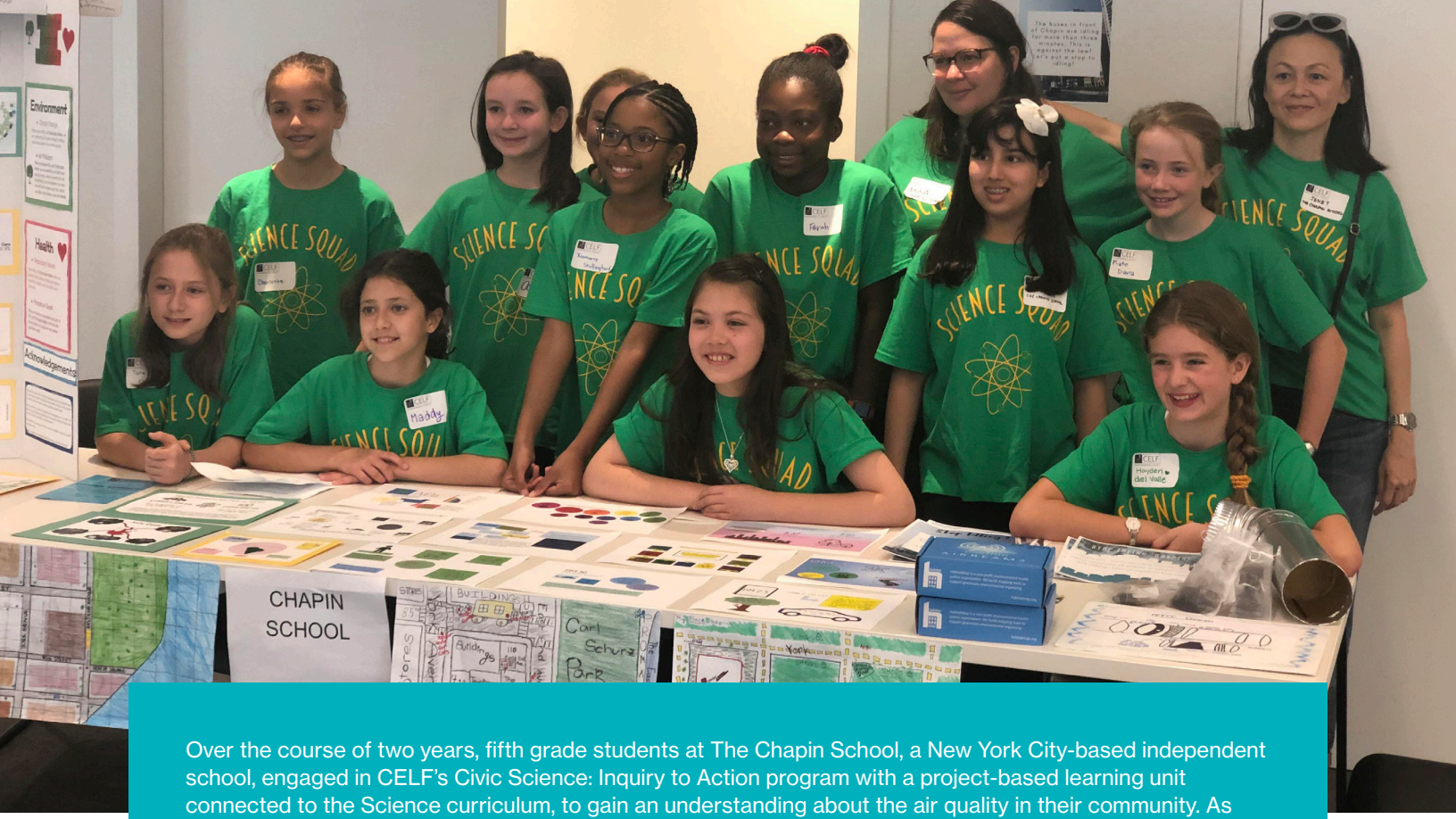


Over the course of two years, fifth grade students at The Chapin School, a New York City-based independent school, engaged in CELF's Civic Science: Inquiry to Action program with a project-based learning unit connected to the Science curriculum, to gain an understanding about the air quality in their community. As they measured and analyzed air quality parameters, students were inspired to take action to improve the air both at school and across the boroughs of New York City. When the second year was interrupted by the global COVID-19 pandemic,a global pandemic, teacher Anna Jacinta Mello rose to the challenge and adjusted activities so that students could continue their research virtually.

BACKGROUND

The Chapin School is an independent K-12 all-girls school on the Upper East Side of Manhattan. Founded in 1901 by Maria Bowen Chapin, the Chapin School is "dedicated to empowering a diverse, ambitious and resolute community of young women to thrive and lead in their world." Chapin's college preparatory curriculum focuses not only on academic achievement, but also considers the social and emotional growth of each student. Chapin considers bravery, compassion, service and respect for self and others to be fundamental values.

Anna Jacinta Mello grew up in Brazil and Washington Heights, NY where she attended NYC public schools. After graduating from Swarthmore College, Anna spent time teaching at the Cloud Forest School before getting her master's degree and eventually moving back to New York. In 2018, Anna began teaching fifth grade Science for approximately sixty students at Chapin each year. Anna learned about CELF's Civic Science program from a colleague and immediately wanted to get involved in the program.

In the winter of 2019, Anna participated in CELF's Civic Science Inquiry to Action Program tailored to each participant's school and community location. At the time, the program provided two full-day professional learning workshops for teachers and on-site support to implement a project-based learning module that connects students to real-world challenges in their own neighborhoods. Anna enjoyed learning about CELF's Civic Science air quality monitoring program, and thought it would be an engaging topic to bring to her classroom. She decided to involve all of her students and to embed the work in her Ecology unit.

Over the course of two school years, Anna involved her students in an extended CELF air quality project. The second year was interrupted by the closure of Chapin's school buildings due to the Coronavirus pandemic. Anna reassessed the unit, which proved adaptable to and meaningful for remote instruction and learning from home.

YEAR ONE

During the first year of Civic Science with her students, the unit was guided by answering two questions:

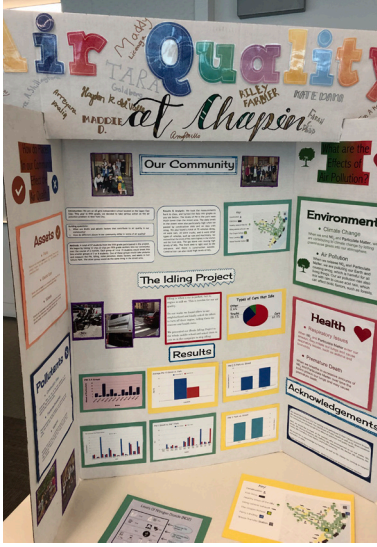
1. "What are the abiotic and biotic factors that contribute to air quality in our community?"
2. "How do different places in our community differ in terms of air quality?"

Based on what Anna learned in CELF's workshops she was able to reimagine how to bring the content and material to the students. "The students and I planned the data collection part together. Some of the planning was done before the unit and some as the unit was unfolding. I spent a lot of time outside organizing some of the data to make it more accessible to the students for graphing and analysis."

At the start of the unit, Anna's students reflected on sustainability, what the concept meant to them, and discussed CELF's Big Ideas of Sustainability framework. Reading children's books such as "The Lorax" and "Mayah's Lot" helped ignite discussions of environmental impact and justice. Anna introduced air pollution, with each student filling out a Know, Wonder, Learn (KWL) chart throughout the unit.

Adapting one of CELF's activities from the Civic Science workshop, Anna had her students draw maps of their neighborhood and predict areas where there might be poor air quality. They connected environmental justice to air quality by reading articles and discussing air quality data from neighborhoods throughout NYC.

Before the students went outside to collect data, the class decided what data they wanted to collect and how they would record this information. Students broke into groups that collected air quality data, took photographs, reported idling cars, registered air pollution sources and recorded biotic and abiotic assets to air quality.



Divided into two research groups and monitored with the help of Anna's colleagues, the students went outside to different parts of the neighborhood to collect data. As the students collected data on the streets and in the local park near the school, they noticed a significant number of idling cars. In NYC it is against the law to idle for longer than three minutes. They respectfully asked drivers to turn off their engines, and met with success. The first student to do so excitedly proclaimed, "I made a difference!"

This inspired Anna's students to develop a "Stop Idling" school campaign. They put together an informational pamphlet on idling to place around the school, and a small info card to hand out to idlers they encountered during fieldwork. They presented their idling information at a Middle School meeting, encouraging other students to get involved in their campaign.

Once students had collected all the information, it was time to tell their data story. With help from a technology teacher, students learned the nuances of google sheets, google draw and the noun project. The math teacher worked with students to graph their data. Some of the students were inspired to engineer solutions to the air quality issues and designed an air filter system to be used to reduce particulate matter from car exhaust.

Students presented their findings, inventions and action plans at a city-wide CELF Student Symposium held at CUNY School of Law in partnership with the Center for Urban Environmental Reform, and at a private investor forum, also organized by CELF. Presenting to a diverse audience of stakeholders and decision makers helped the students build confidence and communications skills.

Anna concluded Year 1 of the CELF Civic Science and Air Quality project saying, "Students were very proud of the work they did during the unit. They felt like they were contributing to their community, so they were very engaged and excited to take action. I noticed that almost all of the students were engaged with the project and data collection and analysis. This was especially true for students who struggled with science."

YEAR TWO

After the first year of air quality monitoring with her students, Anna wanted to keep up the energy and momentum and begin collecting air quality data with her students early in the 2019-2020 school year. Her students began monitoring air quality in September 2019 on a school sponsored trip to Cape Cod, MA.

The second year was interrupted by the closure of Chapin's school buildings in March of 2020 due to the Coronavirus pandemic. Anna reassessed her Air Quality unit, which proved adaptable for remote instruction and learning from home. Using a new guiding question, "Is air in NYC equitable?" the program's content migrated seamlessly: from neighborhood mapping, particulate matter and environmental justice to an online format. Anna added visual simulations and infographics of how air pollution moves to replace the modeling done in class. Students continued their no idling campaign by creating public service announcements they posted to FlipGrid.

Students used NYC tree maps to determine how much air pollution is removed by different types of trees. To find the answer, students delve more deeply into public data available online, including the NYC Street Tree Map. This resulted in students supporting initiatives to plant trees.

Following CELF's Inquiry-to-Action model, Anna incorporated action into social justice issues related to air quality in different parts of NYC. To accomplish this online, she had students to research air quality in neighborhoods throughout the city, not just where they lived. Each student researched geography, socio-economy, sources of pollution, and demographics, as well as health metrics, such as asthma rates. Students used the NYC Department of Health Environmental Data portal resources to find and graph PM 2.5 data, traffic density, and asthma hospitalization rates. Each student created a map of her assigned community using either Google maps or a hand drawing. Once they analyzed this data they made a neighborhood infographic on Canva or google draw. At the end of the project, students reflected on air quality in their neighborhood, and presented their findings to each other. Students were then asked how they would use their voice to make changes in NYC and to produce actionable items. At the end of the chaotic 2019-2020 school year, Anna felt that some students had difficulty concentrating online, "but I think overall all students were engaged and the feedback I got was of how much they learned and were ready to use their voice to take action. When something is personal, it affects the community where they live, the students can contextualize the science and connect more to the material."

One student shared her conclusion on the need for action as such: "Making sure that air quality is a right means New Yorkers would have to take action."

SO WOULD ANNA RECOMMEND CELF'S CIVIC SCIENCE PROGRAM TO HER COLLEAGUES?

"CELF gives you the tools and resources and allows teachers to make the learning, implementation, and organization pertinent to different content areas. Each teacher can take those tools and resources and use it in so many different ways. It is also a way to empower students and bring the context of their community to the forefront, science is now something that happens within their community and not outside of it. I would definitely recommend it to other teachers as a way to weave civics, action, and social justice into a science classroom."

Anna Mello
Grade 5 Science Teacher
The Chapin School