

Mount Vernon Student Summer Energy & Environmental Program

A Demonstration Project

Summer 2021



Guest Speakers



New York State Assembly
Member J Gary Pretlow



Mount Vernon Mayor Shawyn
Patterson-Howard



United States Congressman
Jamaal Bowman



Donovan Gordon, Director of Clean Heating & Cooling for the New York State Energy Research and Development Authority (NYSERDA)



Myron Alexander and his sister Leah Alexander from OWARECO, LLC
Food Waste

Team

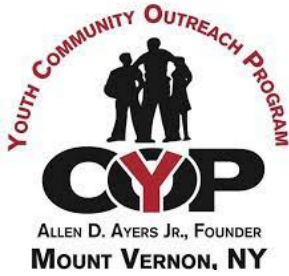


Counselors in Training, 2021



Facilitator, Interns, and Volunteer

Acknowledgements



Mount Vernon Youth
Community Outreach Program



NYSERDA

New York State Energy
Research Development Authority



Comrie Enterprises, LLC

Environmental
Leaders of Color 

Environmental
Leaders of Color

Facilitator

Claude Howard

Interns

Denisse Belliard
Raphael Brown
Flor Najera

Volunteer

Tariq Khan

WELCOME LETTER

The objective of the Mount Vernon Student Summer Energy and Environmental Program was to expose young people from marginalized communities to the adverse impact of climate change and their roles in climate solutions. Climate change will disproportionately impact communities of color and communities of limited resources. Young people in these communities must become aware of the problem, its impact on their lives, and their power to elicit change through education and advocacy. Preparing the next generation to live and work in a climate-conscious world is an all-hands-on-deck issue.

This Summer Program, now established in Mount Vernon with demonstrated success in enlightening young people to the impacts of climate change, it can be easily replicated in other communities. Such an effort will merely require financial resources for facilitators, transportation for site visits, supplies for experiments, program facilities, and funds for summer stipends– a small investment to prepare our youth with the skills to change their community and the world for the better. Elected officials and business community members can play a critical role in providing funds for upcoming summer programs.

On a large scale, organizational systems need to be in place to ensure that community programs are running successfully and that stakeholders have access to required resources, be it access to environment/energy firms for site visits, qualified guest speakers, program planning, and experienced facilitators who encourage student participation.

Congratulations to the Mount Vernon Student Summer Energy & Environmental Program students! A very special thanks to the Mount Vernon Youth Community Outreach Program leadership and staff for participating in this demonstration project.

For more information:

Diana Williams

Program Organizer

[Comrie Enterprises, LLC](#)

info@comrie.biz

[Environmental Leaders of Color](#)

914.664.6356

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I PROJECT DESCRIPTION

a) Introduction

We live in a world where climate change is an inevitable and growing peril to our environment, our way of life, and our very survival. No longer can we confidently expect to forestall it. Now, alas, our best hope is to mitigate its worst effects. And in that regard, we must reckon that our collective efforts thus far have been futile, and time is no longer on our side.

In July of 2021, Comrie Enterprises, LLC, and Environmental Leaders of Color, with funding from The New York State Energy Research and Development Authority (NYSERDA), launched a climate change and clean energy demonstration project in Mount Vernon, New York, for local high school students.

The project, from now on referred to as the Mount Vernon Student Summer Energy and Environmental Program or “the Program” was designed to introduce high school students to the phenomenon of climate change – its underlying scientific basis (i.e., the greenhouse effect), causes (e.g., fossil fuel consumption), and consequences (rising temperatures, environmental degradation, social upheaval, etc.)



Learning about Food Waste and Food Insecurities

b) Mission, Goal, and Objective

The mission of the Program is to position communities of color as essential partners in the creation, development, and implementation of solutions to the global crisis of climate change.

An attendant goal is to spread the word about the threats, challenges, and opportunities that climate change presents to communities of color, which are the very communities that continue to bear the brunt of climate change's harmful effects in this country.

Our main goal – and the subject of this report – was to design and test an educational program for high school students in communities of color focused on climate change and clean energy. ¹

Additionally, we should consider the Program as a potential pipeline program connecting students to other opportunities within and beyond their communities. And that based upon their expressed interests and demonstrated talents, they may be seamlessly directed to appropriate mentors, internships, and other esteemed organizations.

c) Concept and Design

(i) Core Concepts

Because our objective was a program that could reach as many underserved youths as possible, we contemplated features that would create a vehicle for other organizations to adopt in their communities. Four elements fulfilled this concept – accessibility, portability, modularity, and affordability.

Accessibility. To attract and engage Generation Z students, the Program incorporated teaching techniques and lesson plans that position students as active participants in their learning. Tools utilized included student-run experiments and demonstrations, intra-class team competition, class projects, stimulating demonstrations (visual and auditory), and collateral exercises (e.g., brainteasers, logic problems). There was minimal instructor lecturing, use of PowerPoint, or other strictly didactic measures. This approach enhanced student engagement and our successes demonstrated that also incorporating simple measures such as humor facilitated effective learning.

Portability. The Program is flexible and amenable to multiple venues – a traditional classroom, a church basement, even a living room. The basic requirements are an electrical source and a sink with running water. Wi-fi and laboratory apparatus are unnecessary.

1. The Environmental Protection Agency's recent report, *Climate Change and Social Vulnerability in the United States: A Focus on Six Impact Sectors*, is one of the most advanced environmental justice studies to date. It indicates that racial and ethnic minority communities are particularly vulnerable to the greatest impacts of climate change.

Modularity. An essential aim of the Program was to package it in such a manner as to allow easy insertion into a larger educational setting with minimal adjustments necessary on the part of the institution adopting the Program. Thus, the Program can be run as an after-school option, a summer school component, or a traditional high school elective. Each class runs approximately the same length of time and is a self-contained unit. The Program can operate daily, every other day, or twice weekly, depending on the organization's needs adopting it.

Affordability. Every effort was made to keep program expenses low. By identifying that laptop computers and other costly items were unnecessary for the participants' success, this Program could be affordable for various organizations. Additionally, thoughtful selection of laboratory apparatus further allowed significant cost savings.

(ii) Participants

Participant Recruitment: Student participants represented a subset of preteen/teen students in two pre-existing summer programs enrolled at their respective sites.

- **Site I-** the students were selected from the group of Counselors-in-Training (CITs) working for a church-based summer camp.
- **Site II-** students were selected enrollees of the Mount Vernon Youth Bureau summer camp.

There were no educational prerequisites for student participation. Consequently, the students had varied math and science backgrounds and exhibited varied mastery of relevant scientific concepts.

Course Length and Schedule: The demonstration project was scheduled to run for six weeks. The Program operated at two locations – Site I operated on three 2-hour sessions a week, while Site II ran on a schedule of five 3-hour sessions a week. The scheduling disparity was not by program design but was a consequence of the requirements of our site sponsors (who hosted the students and provided the facilities at no cost to the Program).

Student Assessments: It bears mentioning that the Program eschewed most traditional methods for measuring and documenting individual student participation, performance and achievement. Our program design used more non-traditional approaches to foster student engagement and evaluate student participation, performance, and achievement. This included not recording attendance, not assigning homework, and not awarding student grades.

Participant Cost: The Program was at no cost to all participants, strongly recommend additional student stipends in the future.

(iii) Curriculum & Course Outline

Consistent with our objective, we sought a curriculum that would resonate with young people of color to optimize successful student outcomes. We implemented an innovative approach characterized by the elements elaborated in our course outline (see below).



CITs unwrapping their new reusable water bottles

Our goal was to highlight scientific concepts that underlie the study of shifts in climate patterns and emphasize relevant applications in other fields. One example is the classic titration experiment, which illustrates the idea that persistent, incremental change to a system can produce a cataclysmic event when that system's ability to absorb the change is exceeded. This was visually illustrated to the students during a demonstration of the classic acid-base titration experiment, using water, vinegar, lye, and phenolphthalein.

As to clean energy, we focused our mission on engaging participants in problem solving and instructed them in various solution-seeking methodologies and techniques. For instance, we provided specific examples of how real-world scientists and inventors solved complex problems they encountered on their way to achieving breakthroughs.

In summary, our goal was to conceptualize an innovative approach to reach our student participants by exposing them to scientific principles, while concurrently linking these with their real-life experiences.

Below is the Course Outline for the Program. Class trips were not feasible due to the constraints of COVID-19. We were fortunate to have several important individuals contribute to the education of our students in the role of visiting lecturers. These included climate change entrepreneurs and elected officials. In addition to providing valuable insight about how they advance the cause of climate change in their chosen professions, they served as important role models to the students.

Class 1

Topic: What Is the Greenhouse Effect, and Why Is It Important to Us?

Class 2

Topic: The Relationship Between the Greenhouse Effect and Climate Change

Class 3

Topic: Rising Sea Levels

Class 4

Topic: Human Activity and Climate Change

Class 5

Topic: Why We Produce Energy

Class 6

Topic: The Preeminence of Electricity

Class 7

Topic: Energy Production, Challenges, and Choices

Class 8

Topic: Energy Efficiency, Expense, and Social Cost



Claude Howard, Program Facilitator, and CIT performing an experiment with water balloons

Class 9

Topic: Testing Your Knowledge

Class 10

Topic: Individual Choices and Collective Responsibility²

Class 11

Topic: Introduction to Class Projects

Class 12

Topic: Class Project Design

Class 13

Topic: Class Project Completion and Course Wrap Up



Marvin Church speaking about the importance of clean energy

2. Students were given reusable metal water bottles to replace the single use plastic bottles that many had been bringing to class. By the last class of the summer, most of the students were using the reusable metal water bottles.

d) Project Financials

The following table presents the actual budget (expenses and funding) for the Mount Vernon Student Summer Energy & Environmental Program:

<i>2021 Mount Vernon Student Summer Energy and Environmental Program Budget</i>	
Expenses	
Program Director: Curriculum Design Lesson Plans On-Site Instruction and Facilitation Program Evaluation and Final Report	\$8,500.00
Student Interns (funded by NYCERDA): Assistants to Program Manager	\$2,621.60
Laptop Computers (8)	\$2,815.38
Supplies and Equipment	\$1,650.00
Stipends	\$850.00
TOTAL EXPENSES	\$16,436.98
Income (Funding)	
NYSERDA Internship Program - Grant	\$2,621.60
Comrie Enterprises, LLC - Donations	\$8,815.38
Environmental Leaders of Color - Donations	\$5,000.00
TOTAL FUNDING	\$16,436.98

Summary Statement:

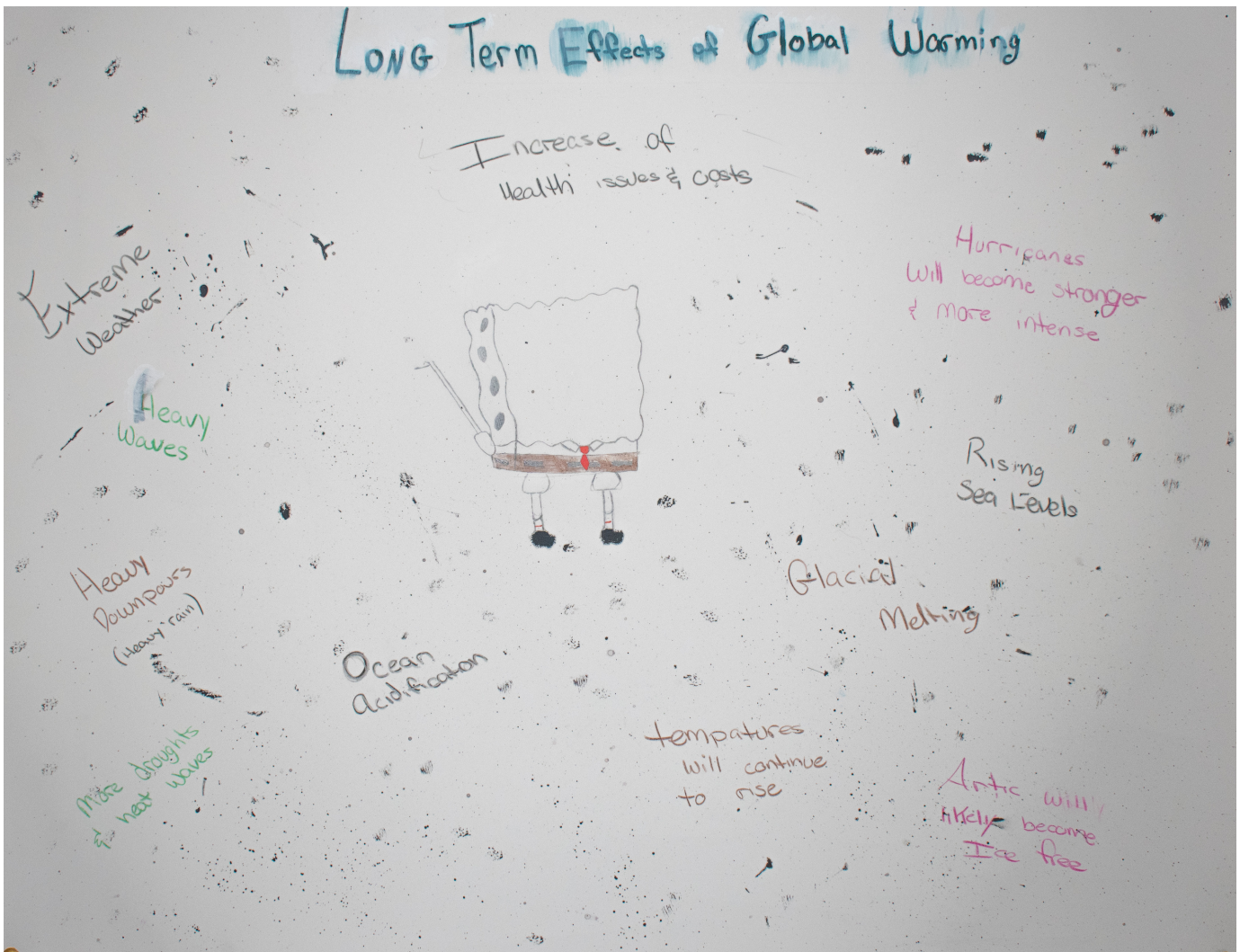
1. The highest expense went to curriculum preparation and the facilitator's salary.
2. Student stipend was \$50.00 per student for the summer for a total budgetary expense of \$850.00
3. Laptops were available to students but because of difficulty with the internet connection, they were not used. At the end of the Program, laptops were gifted to host sites.

II PROJECT OUTCOME

Participants' Final Project

Utilizing the vast knowledge acquired during the Program, the student participants created powerful messages conveying the significance of climate change and its impact on their communities. The outcome – their final projects – showcased their exceptional talents and exceeded all of our expectations. These are presented as posters and a video as below.

A) POSTER PRESENTATIONS



SAVING PLANET EARTH

Some 4-12 million metric tons enter oceans annually.

plastic becomes brittle breaking down from the UV rays in sea light and from wave action

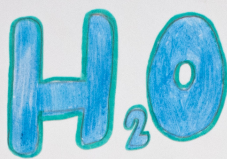


"60% to 90% of the Ocean is polluted with Plastic."

Toxins (PCBs) Adhere to plastics, creating sinks of

Plastic debris has been

Microplastics make up nearly 95% of shoreline beach plastic pollution



SAVE THE EARTH



Zola Isach

B) VIDEO PRESENTATION

How will Life on Earth Look in 2050?



III PARTICIPANT'S EVALUATIONS

Participant's Program Evaluations

To elicit feedback about the Program, each of the 17 participants who completed the Program was asked to complete a Course Evaluation. Below is a summary of their responses:

Q1 - What have you learned in the (Clean) Energy and Sustainability Program this summer that has changed your behavior?

The most frequent responses were:

- The environmental damage that overuse of plastic is causing (5)
- The everyday things that we do that destroy the earth (4)
- The environmental damage that greenhouse gases are causing (4)

Q2 - Have you shared the information you learned this summer with family and friends?

Eleven (11) students said "Yes".

Four (4) students said "No".

Q3 - Would you attend a similar program again to learn more?

Eleven (11) students said "Yes".

Four (4) students said "No".

Q4 - What else would you like to learn about?

The most frequent responses were:

- Hearing from the experts who are doing cutting-edge work (11)
- Learning more about what other countries are doing to fight climate change (6)

Additional responses: Careers in (clean) energy and sustainability (3); College programs for (clean) energy and sustainability (2); Paid internships in (clean) energy and sustainability (5); Local organizations doing work with (clean) energy and sustainability (5); How to become a (clean) energy and sustainability ambassador (1)

Q5 - What did you like (most) about this year's program?

The most frequent responses were:

- Experiments (8)
- Subject Matter (3)
- Projects (3)

Additional responses: the instructors, watching videos and the guest speaker talking about a food waste system.

Q6 - How can the program improve?

The most frequent responses were:

- More Experiments (4)
- Reduce Repetitiveness/Make a Lesson Plan (4)
- Shorten Class Time (3)

Additional responses: lengthen the time allotted to group projects to 3 sessions; invite more guests speakers; incorporate more information about cutting-edge technology; use more videos.

Q7 - Anything else you'd like to share about the program?

The most frequent responses were:

- "No" (9)
- The instructors were nice/cool (3)

Additional responses: make the Program more fun; make the classes shorter than 2 hours; get more enthusiastic volunteers/interns interested in the topic.



Diana Williams, Program Organizer, explaining summer activities.

IV LESSONS LEARNED AND RECOMMENDATIONS

Lessons Learned

There were multiple significant lessons learned during the Program. These are summarized below:

1. Course Design and instructions

We noted that PowerPoint presentations and didactic lectures were not very effective in engaging our summer 2021 participants. In contrast, students were highly attentive during laboratory experiments and presentations by guest speakers. Particularly noteworthy were the global warming experiments, which completely captivated the students' attention. Also, student engagement peaked during participation in poster designs and role-playing as on-camera announcers during the news task project.

2. Instructor Selection

We observed early in the course that instructor enthusiasm was critical in engaging students. This led to some early changes in our selection criteria, thus revamping our instructor roster to reflect consideration of instructor personality in addition to knowledge.

3. Student Challenges

Our students belonged to a socio-economic group burdened with financial needs, heightened during the COVID-19 pandemic. Consequently, student participation at sites without financial supplementation (Site II) was significantly lower than at the other site (Site I). Therefore, finances play a role in students' ability to participate effectively in this Program.

Recommendations

1. Course Schedule and Curriculum Content - Based upon our proposed curriculum, we recommend 3-5 days per week of project activities. For on-site instruction, 90-minute segments with two 15 minute breaks would be ideal based upon our observation of student inattentiveness during more extended periods. We further recommend reaching out to facilitators who successfully engage students for longer intervals for their guidance and suggestions.

We recommend experiments/demonstrations be emphasized due to the students' heightened interest during these activities. Additionally, the continued inclusion of guest speakers, who work in the clean energy field and highlight the Program's relevance to the students, is highly endorsed.

2. Integrate Mission with Community - The overarching mission of the Program was to task the participants to use the knowledge acquired from the curriculum to create climate change messages relevant to their communities. We recommend fostering strong community connections that will further encourage these talented students to project their powerful messages to inform their community members about this vital topic.

3. Class Trips -The Program design included class trips for the students to visit facilities that design alternative energy generation, transmission, or storage methods. However, due to the constraints imposed by COVID-19 mandates, these trips were not feasible. Although planned class trips did not materialize for this participant group, we highly recommend that future programs integrate class trips as another tool of program enhancement. One option could be holding three days of on-site instructions and 2-days of class trips each week.

4. Student Stipend - We recommend that future program proposals include provisions for stipends that will increase student participation. This would alleviate the financial burdens on students in this socio-economic group who rely on summer employment to supplement their family's income. Stipend amounts should match local summer student employment salaries. Finances may be the only obstacle preventing some very talented students from joining in this incredible opportunity to showcase their talents, connect to their community, and simultaneously provide a community service.



Students working on their final projects