



Annual Report 2022-23

Prepared by

Amy Liu
Arshdeep Singh
Lavanya Gupta
Akhil Atluri

Aryan Waghmode
Grace Wang
Brandon Yoo
Anthony Han



Seedling



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SEEDLING, INC.

ABOUT US

In 2019, we visited the Bethel Farm Lab, a community garden in the Oliver neighborhood of Baltimore, Maryland. With Oliver having a high poverty rate and limited access to grocery stores, places like the Bethel Farm Lab were valuable sources of fresh, nutritious food. However, due to a lack of financial resources and sufficient volunteer participation, the garden often struggled to be maintained.

With food insecurity being a widespread issue in Baltimore, we looked for a way to overcome the limitations posed by traditional gardening methods: hydroponics. Years of research, prototyping, and networking with community members proved that hydroponics could be a low-cost, time-, and space-efficient way of introducing fresh produce into everyone's diets.

Since Seedling's incorporation as a 501(c)(3) non-profit organization in 2021, we've evolved from not only manufacturing and selling subsidized hydroponics kits to food-insecure families in Baltimore but also partnering with schools and afterschool programs to teach an interactive, interdisciplinary, and experiential curriculum covering healthy eating and technical skills in STEM and horticulture.

With our mission to provide youth the opportunity to lead healthier lives and improve health outcomes for families in healthy food priority areas, Seedling has grown to reach 150+ children across Baltimore, and even greater numbers of Baltimore community members. As we continue to expand our curriculum and foster connections with food justice organizations and students eager to learn, we're excited for what the future holds.



FOREWORD FROM LEADERSHIP



Arshdeep Singh, Co-Founder

In a world where education provides the framework for adaptability and innovation, Seedling Inc. provides an exceptional educational environment that transforms learning for students PreK - 12. Through our interactive year-long curriculum, Seedling empowers young minds and enhances education to allow students to reach their full potential.

Seedling believes education should be both immersive and engaging. We recognize that learning potential occurs when students are active participants in their educational journey.

By designing a curriculum from scratch with active student engagement in mind, Seedling fosters a love for learning by integrating interactive experiences, academic rigor, and practical applications.

A core component of Seedling's educational philosophy is curriculum personalization. Each of our students are unique individuals with different passions, talents, and learning styles. Seedling celebrates this diversity by tailoring its curriculum to the specific needs of every learner. By creating an environment where curiosity is encouraged and strengths are nurtured, Seedling empowers its students, inspiring self-confidence and autonomy.

Technology plays a pivotal role in Seedling's curriculum where virtual simulations can allow students to use 3D modeling software with limited hardware. Through collaborative projects, Seedling has been able to unlock the creativity and critical thinking skills of students and bridge the gap between classroom learning and industry-standard equipment.

Central to Seedling's educational model success is its faculty. By having passionate and dedicated faculty, our team is committed to providing an enriching learning environment to its students. Seedling's educators bring creativity and love for teaching into the classroom, and their contagious demeanor uplifts students and makes them want to learn.

Through Seedling's yearlong interactive curriculum, personalized approach, and commitment to holistic development, Seedling has enhanced education for its students. As we teach more students, we can discover new and innovative approaches to make education more seamless for students. Seedling nurtures minds and takes a part in shaping the trajectory of education for generations to come.

Arshdeep Singh, Co-founder

INTRODUCTION

We at Seedling believe everyone should have the opportunity to access fresh food and a healthy diet, regardless of their socioeconomic background. In Baltimore City County alone, 146,077 Baltimoreans go hungry. In addition, approximately 23.5% of the Baltimore population live in food priority areas. This means that they do not have reliable access to fresh food due to a lack of nearby grocery stores and/or limited income.

Seedling combats the issue of food insecurity to improve health outcomes in Baltimoreans through a two-pronged approach: the development of affordable hydroponics farming units and by working with a network of nonprofit organizations and schools in the Baltimore area to provide curricula on food systems to youth.

First, by developing a unique and versatile food science, food equity, agriculture, and technical skills curriculum for students at after-school programs and middle schools in Baltimore, Seedling teaches youth the importance of fresh food in healthy living as well as the systemic barriers that prevent it. We devised our curriculum to be experiential, interdisciplinary, application-based, and community-centered. It includes projects such as water quality testing, plant experiments, business proposals, and games. In addition, by discussing the historical and contemporary situations of many Baltimoreans, Seedling equips students with the knowledge to better navigate their personal relationship with healthy foods, encouraging them to implement healthier, more sustainable habits.



Our curriculum also covers the fundamentals of plant science, technological innovation, business/marketing, and technical skills. These versatile skills and knowledge can be applied to any field students are interested in, promoting their professional development. Students are encouraged to take advantage of the interdisciplinary nature of our curriculum to explore any and all avenues they find intriguing. These topics all create a cohesive education for students that give them the skills and knowledge they need to live healthier lives.

However, our curriculum not only aims to improve the health outcomes of these students, but also the greater community. For example, to increase civic engagement, we are collaborating with Baltimore Hunger Project to connect students to volunteer opportunities so they can apply the knowledge they gain from the curriculum to serve their community. We are also continuously seeking out new community partnerships with community gardens, local farms, entrepreneurs, and nonprofits in the food security space to offer more experiential learning resources for our students.

The Seedling curriculum is supplemented by our hydroponics units. Our affordable hydroponics unit allows customers and students to increase their access to fresh food while contributing to the solution of food injustice in Baltimore, all while making schools and their neighborhood community a greener, healthier, and happier place. These hydroponic units can be used to grow a wide variety of fruits, vegetables and herbs using a solution of water and nutrients, eliminating the need for soil. This creates a source of fresh, nutritious food for Baltimoreans that is space-, resource-, and time-efficient. These are all vital qualities that make hydroponics uniquely suited for environments with little space for large gardens. Our hydroponics are an effective tool for understanding agriculture and sparking interest in growing fresh, nutritious food in a sustainable manner.

Seedling is passionate about tackling food insecurity and equipping youth with the skills and knowledge necessary to do so as well. Through our curriculum and hydroponics units, we aim to help Baltimore build a healthier, more sustainable next generation.



THE LANDSCAPE

Access to fresh and healthy food is a fundamental necessity in any community. Regardless of socioeconomic background, no one should have to go hungry or be forced to resort to unhealthy food alternatives because of economic and access restraints. However, according to the United States Department of Agriculture, tens of millions of Americans still do not have reliable access to fresh food. Food insecurity is especially prevalent in Baltimore, whose historical economic and social inequities have left tens of thousands of residents food insecure, according to the Baltimore Hunger Project.

Baltimore has a long history, scattered with racist laws and policies designed to segregate and discriminate, forcing many Baltimoreans into communities with high poverty rates with the goal of preventing progress and isolating certain racial groups. These policies, largely passed throughout the 1900s, were often in the form of blatantly racist housing segregation against Black residents, known as redlining. In an effort to maintain residential segregation and prevent any opportunities for Black Baltimoreans, racist policies were passed preventing Black families from moving into white neighborhoods through discriminatory lending policies. For example, in 1910 Baltimore City Ordinance 610 was passed, which prevented Black residents from moving to blocks that were majority white. Although eventually struck down as unconstitutional by the Supreme Court, in its place came even more laws and systems which sought to do the same including the Federal Home Owners' Loan Corporation's Residential Security Map of Baltimore, specific housing developments aimed to segregate Black Baltimoreans, and more.

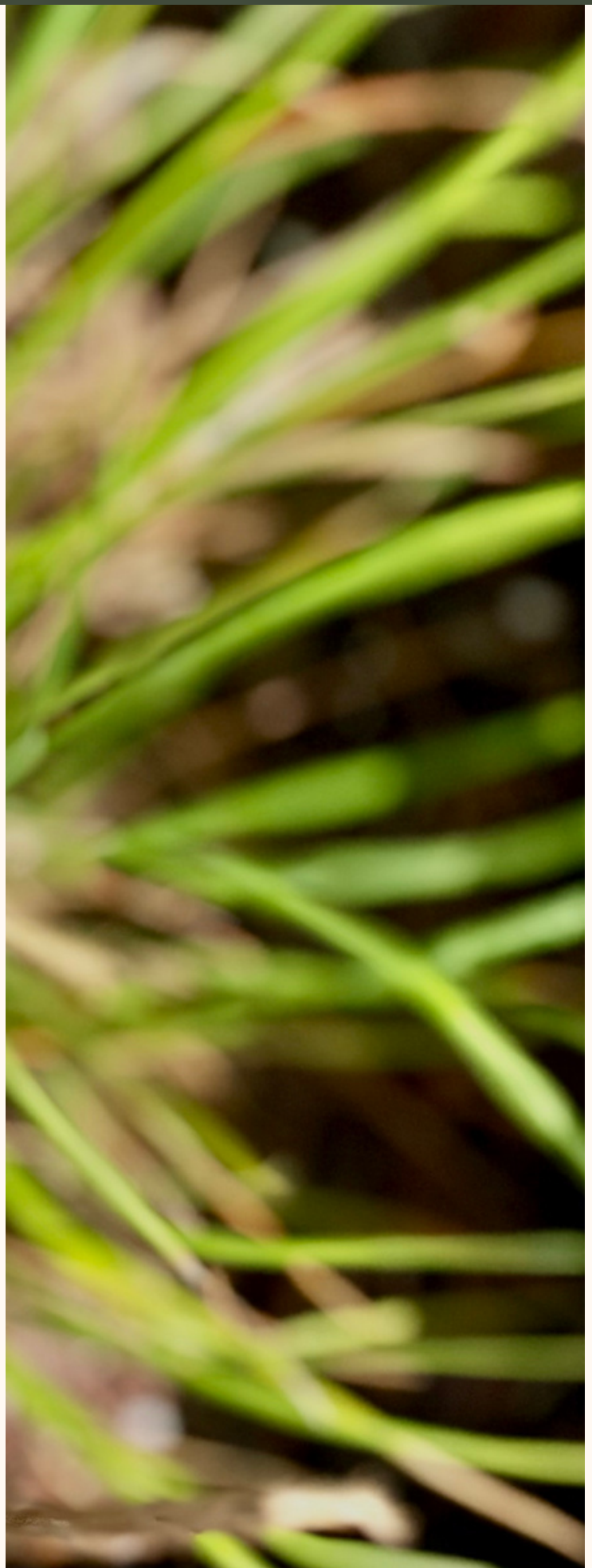
The segregated communities that these laws and government programs created not only last to the present day but often force residents into poverty, eliminating social mobility. The effects were pervasive, especially when considering food access and equity. Many of the communities affected by redlining are now the same communities that have unreliable access to fresh food due to socioeconomic constraints and limited access.



Without reliable fresh food options, residents are unable to meet necessary health tenants. According to studies done by the National Institutes of Health, Feeding America, the Food Research and Action Center, and the Office of Disease Prevention and Health Promotion, the science surrounding food insecurity is tremendously clear: people who experience food insecurity are far more likely to suffer from a range of health problems as well as other socioeconomic problems. So, we must act.

Food insecure areas also affect everyone within the community, especially children who don't get enough healthy and fresh food to eat. According to studies done in the Journal of the Academy of Nutrition and Dietetics, not only does unhealthy eating lead to higher rates of obesity, cardiovascular disease, and diabetes but food insecurity can worsen school performance. Students that don't get enough to eat are less likely to perform well in class.

Given the history of Baltimore, the health, economic, and social impacts from food insecurity, and the continual growth of the problem, we must act accordingly. The food we have access to and the eating habits we develop throughout our lives are extremely consequential in our health, socioeconomic status, and even academic performance and we must take great care when thinking about how to address this vital issue. At every level of society, age, and income, food insecurity has wide reaching effects, and it is necessary to push for change and a solution that benefits those who are at risk.





OUR SOLUTION

We take a two-pronged approach to tackling food insecurity. First, we utilize education as a means to mitigate long-term growth of food insecurity as early exposure to nutritional best practices also helps shape future decisions. Seedling's robust curriculum increases awareness of food insecurity, teaches fundamentals of nutrition, and instills horticultural skills. To account for our diverse audience, our curriculum is tailored to each teaching location to adapt to every group of students' needs, learning abilities, and academic interests. Phases 1-4 of the curriculum provide in-depth education on the valency of healthy, nutritious food, instilling children with all the core information needed to make healthy eating choices and grow and prepare nutritious food. By understanding the importance of balanced diets and the impact of various food groups on their overall health, students will be able to better navigate the local food landscape. In Phases 5-8, students will learn versatile technical skills in the fields of design, engineering, and business. They will learn to take initiative to become leaders in their community and draw real-life connections. Ultimately, our education programs foster healthier eating habits, reduce the risk of diet-related diseases, help individuals in food priority areas better navigate the local food landscape, and promote long-term food security within these communities.

The second prong of our solution model increases access to fresh food through our hydroponics units. Our hydroponics allow for in-house plant growth without the use of soil. This makes growing produce a cost-, time-, space-, and resource-efficient method for implementing fresh, nutritious food into people's diets.

We currently sell two types of hydroponics units: a classroom set for growing multiple plants at once and mason jars for individual plant growth. We sell these units to partner institutions, through our website, and contractually with local businesses. It is through the sale of our units that we are able to subsidize units to use for our education programs.

Combined, our education and hydroponics initiatives increase communities' knowledge of, and accessibility to, fresh, nutritious produce.

OUR CURRICULUM

Phase	Students will learn...
Phase 1: Growing Plants	<ul style="list-style-type: none"> • Plant anatomy, fundamentals of plant growth, and the importance of plants • Skills and knowledge to grow their own fresh produce through traditional gardening methods
Phase 2: Hydroponics	<ul style="list-style-type: none"> • The components of our hydroponics unit, how to build a unit, and the significance of hydroponics • How to grow their own fresh produce through hydroponics
Phase 3: Food Systems, Equity, and Sustainability	<ul style="list-style-type: none"> • Distribution chains that bring food to the dining table, the disparities of food access within the United States and Baltimore, and how they can create change in food priority areas • The barriers to and importance of equitable food access • Small sustainable habits they can implement into their everyday lives
Phase 4: Nutrients & Nutrition	<ul style="list-style-type: none"> • Fundamentals of biology and chemistry, the impact of chemistry on daily lives, and how living systems obtain energy to maintain life • How science, nutrition, and exercise are intertwined
Phase 5: Water Quality Testing	<ul style="list-style-type: none"> • How to build and use water quality sensors, sense pH to determine optimal plant growth environments, and the importance of clean water • Reflect on and analyze the water quality in their own communities • Water quality's consequences on human and plant life
Phase 6: Computer Aided Design (CAD)	<ul style="list-style-type: none"> • Basics of CAD designing using TinkerCAD including drawing shapes and developing 3D structures through project-based learning. • How CAD can be used in varying professions • Problem-solving, strategy, planning, and teamwork skills
Phase 7: Business, Entrepreneurship, & Leadership	<ul style="list-style-type: none"> • Fundamentals of business principles, marketing strategies, goal-setting, public speaking, and teamwork • How to develop and pitch a business proposal • Basics of budgeting and finance
Phase 8: Arduino (coding)	<ul style="list-style-type: none"> • Basic coding principles to code for a project of their choice • How coding can make agriculture more efficient • How to integrate water-quality testing, CAD, and coding to make their own hydroponics units more efficient at growing plants • How coding is useful in our everyday lives

FINDINGS & IMPACT



HYDROPONICS

This year, we fulfilled major hydroponics orders to our new community partners, allowing us to continue increasing hydroponics usage and interest around Baltimore. We are proud to say that we sold 162 total units, 27 times the number of hydroponics sold last year due to these partnerships.

Our partnerships with North Bay Academy and Baltimore Patagonia alone allowed us to reach over 200 families across Baltimore through our hydroponics units, sparking their interests in sustainable growing and eating. We greatly value our direct interactions with community members through in-person programming and seek feedback to consistently improve our products and services.

We are continuously exploring novel ways to boost our hydroponics sales and awareness such as through social media, in-person workshops, farmer's markets, and Kickstarter initiatives. In addition, we expect that refocusing on the marketability of our units through social media initiatives, workshops, and farmer's markets will increase our sales and spark a greater interest in our hydroponics units by the Baltimore community.



EDUCATION

We are proud to announce that we have successfully completed our first academic year of teaching. This year, we taught at three different locations spanning Baltimore: Green Street Academy, For My Kidz, and The Food Project. Our programs reached **over 150 students**: 40% of whom were at the elementary school level and 60% of whom were at the middle school level.

At GSA, a public charter school in Baltimore, we taught 8th graders in the Entrepreneurship elective class. We were diligent in seeking feedback from both the teacher and the students themselves. Our student satisfaction survey sent to all of our GSA students revealed promising feedback.

First, 51% of students who submitted the survey thought that our curriculum was difficult. This demonstrates that our students are being intellectually challenged while not being overly difficult. Additionally, 92.5% of the students learned something new from our curriculum and over 80% of our students are happy with the Seedling instructors. Lastly, over 60% of our students enjoyed our curriculum. Since we were teaching an agriculture and food equity curriculum in a class whose primary interest was in business and entrepreneurship, garnering a majority interest is promising.



We are continuing to implement feedback to improve our curriculum to include content that a broader audience of students will be able to be actively engaged with.

We also administered baseline and progress exams to students at GSA to gauge improvement in knowledge since the start of our class. An analysis of students' grades at baseline compared to the progress exams revealed that **94% of students** experienced a drastic improvement in knowledge of food systems and agriculture.

INTERNAL DEVELOPMENT

In the last year, Seedling's executive team has grown to include even more passionate individuals with diverse skill sets such as marketing, outreach, 3-D modeling, and more. This has spurred advancements in:

- Website remodeling
- Kickstarter crowd-funding initiative
- Increased social media presence
- Farmer's market initiative
- Partnerships and outreach
- Experiential learning resources for students

With so much talent among the team, and even more to come, we are confident in the continued success and advancement of our initiatives, curriculum, and Seedling as a whole.

REFLECTION

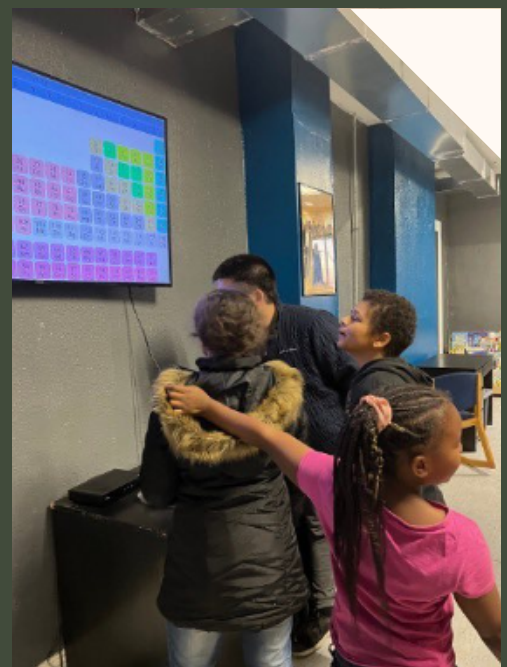
We are extremely happy with the results and feedback from our community partners. Overall, we have observed that our students most actively engage with content that is taught in a game- or competition-type manner, as well as projects, experiences, and active group activities. By collaborating with new community organizations to diversify the experiential learning opportunities for our students, including community farms, animal habitats, guest speakers, and more, we will continue to encourage our students to draw real-life connections.

We also aim to make our curriculum more community impact-oriented so we can teach students to become actively engaged in their communities from an early age. To do this, we will connect students to volunteer opportunities through which they will be able to directly apply their knowledge gained on food insecurity, agriculture, and sustainability to incite positive change in their communities.

Our curriculum content is also undergoing expansion. For example, we are incorporating leadership, professionalism, and public speaking content into our curriculum as these are skills that are useful in many settings. We are also incorporating more real-life case studies, Socratic-style discussions, games and competitions, field trips, presentations, and hands-on projects.

Lastly, we embrace the diversity of our classrooms through the flexibility and versatility of our curriculum. We will continue to tailor our activities to ensure every student we teach, no matter their learning ability, has the opportunity to learn.

Finding ways to improve the learning experiences and engagement of our students and increasing community impact in the food security space is one of our top priorities. Therefore, we are continuously seeking feedback and forming collaborations to enrich the experiences of the youth we serve.



A YEAR'S OVERVIEW

OBSTACLES

Since its founding in 2019, Seedling has grown tremendously, forging connections with communities in Baltimore. But our progress towards our mission is not without its challenges.

1. OUTREACH

We aim to utilize social media as a tool for raising awareness about our mission, impact, recruitment, and forming a widespread network. We have made strategic investments in our online platforms to increase our outreach and engage with other nonprofits in the food security space.

2. HYDROPONICS

Our team will provide additional focus on bolstering our hydroponics sales through new initiatives and partnerships with local businesses to reach the greater Baltimore community. Our team is improving the quality, cost efficiency, and marketability of our hydroponic units.

3. TEACHING

During our first academic year teaching at our current locations, we observed significant differences in the way students respond to different content and teaching styles. In response, our curriculum-building team is working on diversifying the experiential learning opportunities available to our students. At the elementary school level, we are adding more interactive games and breaking down the complexity of our content into its most fundamental terms. At the middle school level, we are expanding on scientific concepts and developing novel, hands-on projects. With our students' learning journeys in mind, we will continue developing a curriculum that fosters a love for learning.



OUR VISION FOR THE FUTURE

We are immensely proud of our growth as an organization and the strides our team has made towards food equity and education. We commit to continuing to expand our impact in Baltimore and beyond going forward through 3 major goals.

1. OUR NETWORK

Our partners are essential advisors and change-makers, inspiring and bolstering our efforts to meet the needs of the youth we serve. Their input helps guide our organization's operations.

Our current network spans Baltimore city schools, community centers, and local farms. Going forward, we will connect with more volunteer programs, local businesses, and other organizations in the food security space to provide students with more experiential learning opportunities. Our curriculum extends beyond the classroom to create real-world impact. Empowered with agricultural, environmental, and technical knowledge, our students are on track to be leaders who can create impacts of their own.

2. RECRUITMENT

We are actively recruiting volunteers to act as leaders and educators on our team. This will develop our capacity to empower young people in our community. We are excited about growing our team and commit to fostering a continually inclusive culture that allows the perspectives of all members to shine.

3. HYDROPONICS

Partnerships with vendors at farmer's markets allow us to connect with the greater Baltimore community while offering healthy produce and raising awareness about sustainable agricultural practices, nutrition, and hydroponics.



DONORS & FUNDING

First, we sincerely thank Dave Silbert of So What Else, whose funding of our educational programs has given us the opportunity to work closely with students in food priority areas and provide them with the highest quality learning resources.

We also greatly appreciate For My Kidz, The Food Project, and Green Street Academy for providing sites to launch our educational curriculum as well as being so providing valuable feedback.



Dave Silbert, So What Else, Inc.



Dr. Carsten Prasse, Johns Hopkins University

We also thank Dr. Carsten Prasse, an Assistant Professor in the Department of Environmental Health & Engineering at Johns Hopkins University, for mentorship from an expert's perspective on our water quality and Arduino curricula allowing us to continue developing engaging learning experiences for our students.

We would also like to thank Social Innovation Lab's advisors (Josh Ambrose, Anthony Watters, and Sephora Saint Armand), cohort, and speakers for providing valuable mentorship and insight, bolstering Seedling's growth as an organization over the past year.

OUR GROWING NETWORK

- Baltimore Patagonia
- Baltimore Hunger Project
- First Fruits Farms
- For My Kidz
- Green Street Academy
- North Bay Academy
- Social Innovation Lab
- So What Else
- The Food Project



CONNECT WITH US

PARTNERSHIP INQUIRIES

seedlinghydroponics@gmail.com

WEBSITE & SHOP

www.seedlinghydroponic.com

SOCIAL MEDIA

Instagram: [@seedling.inc](https://www.instagram.com/seedling.inc)

LinkedIn: [Seedling Hydroponics](https://www.linkedin.com/company/seedling-hydroponics)

Facebook: [Seedling Hydroponics](https://www.facebook.com/seedlinghydroponics)

ADDRESS

320 W 29th Street #200

Baltimore, MD 21211

