

M. R. HOLLIS INNOVATION ACADEMY STEM PARTNERSHIP

» PHASE II REPORT



**Center for Education
Integrating Science,
Mathematics, and Computing**

**Georgia
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M. R. HOLLIS INNOVATION ACADEMY STEM PARTNERSHIP

MISSION

Through partnership with M.R. Hollis Innovation Academy, the Center for Education Integrating Science, Mathematics, and Computing (CEISMC) aims to strengthen the connection between Georgia Tech and its surrounding community. The goal of this partnership is for CEISMC to support the development and implementation of high quality STEM curriculum at Hollis Innovation Academy through direct involvement in the school, utilizing the varied resources available to a leading technical research university. The success of the partnership will demonstrate the powerful potential of university engagement in K-12 schools.

PRIORITIES

The partnership's four guiding priorities are as follows:

1. Strengthen the Instructional Program

- » STEM Curriculum Development Pre K-8: Working with the EL consultant, principal, STEM coordinators and teachers to develop high quality STEM content, skills development and problem based activities into the EL curriculum.
- » Technology Integration: Working with CREATE Lab, EL, principal, STEM coordinators, technology specialists, librarians, and teachers to integrate technology into the learning experiences of students at all grade levels.
- » Out of School Programming: Collaborating with network of community providers to offer an array of curriculum aligned and STEM focused after school, Saturday, competitions, and Summer programs.

2. Align Systems and Resources to School Needs

Evaluation and assessment: Working with APS, school leaders, and the Blank Foundation to design and implement an evaluation plan to provide data for program improvement and resource allocation, gauge progress toward goals and assess impact.

3. Prepare and Develop Knowledgeable Staff Focused On Quality Teaching

Professional Development and Support: Collaborating with EL, GaDOE, other IHEs and educational agencies, and APS to offer intensive, sustained, real time support to teachers to enhance STEM content knowledge, technical skills, pedagogical expertise, ability to plan and carry out problem based and hands on learning activities, and other relevant topics.

4. Build a Positive and Engaged School Culture

Continued Engagement and Partnership: In addition to constant presence within the cluster, CEISMC will continue to participate in the Education Collaborative and other efforts to support continuous improvement and student achievement.



Phase II Highlights and More

Phase II STEM Partnership

From introducing STEM professionals with hands-on experience into the school to welcoming its first middle school class, a lot has changed in the first two years at Hollis Innovation Academy. Building off of all that was accomplished in phase one, phase two of CEISMCM's partnership with Hollis Innovation Academy continued to support improvement in all of the partnership's four guiding priorities. Both Hollis and CEISMCM have seen sweeping changes in the adoption of new curriculum and the precursors of STEM integration school-wide. "I think that what's changed between last year and this year is we have tried to push more into whole school engagement," Dr. DeStefano said. "I think our first year we were really set on getting the STEM teachers really where they needed to be. Then, in our second year, we really were trying to focus on pushing out into the grade levels so that the classroom teachers could reinforce, extend, and lay the foundation for what the kids were doing in the STEM classroom."

Along with laying a proper foundation for learning, the past year has brought impressive new partnerships and resource integration to the development of Hollis. From the support of STEM learning programs through NCR's \$1 million investment with the Westside Future Fund to community resource support such as the Atlanta Science Festival, Nerdy Derby, and CREATE Lab technologies, Hollis has experienced an immense amount of progress through the resources its community has provided in the past year. "It is a really exciting partnership," said NCR's Foundation lead Yvonne Whitaker. "We are taking a global tech company (NCR) and a renowned university (Georgia Tech) through an investment to the WFF that is ultimately going to be benefiting the students and families and teachers at Hollis Innovation Academy."

Hollis's staff not only developed as a community by embracing new curriculum, but the staff also welcomed new support from STEM professionals through the Innovators in Residence which placed four STEM professionals hired by CEISMCM alongside the STEM teachers. Development in the rest of the school's educators has changed over the past year as well, and the professional development of phase two encouraged partnerships between STEM and non-STEM teachers. As one STEM teacher mentioned, "my skill knowledge has increased, and I can help my staff, my teammates, more than I would have before."

This past year at Hollis has not only provided other schools with an example of all that can be accomplished through these programs, but it has also provided an example of development and change on the Westside. With the advancement of housing initiatives, health movements, and community revitalization, Hollis is only one of the many factors contributing to the future of the Westside.



A Mid-Summer's Learning



“We always like to say that potential is distributed equally and that opportunities are not. Our main goal is to provide those opportunities for the students and teachers at Hollis to reach their goal of being a STEM certified school.”

Yvonne Whitaker, NCR Foundation

Along with new developments in curriculum, STEM integration, and professional development, Hollis' second year has introduced exceptional new partnerships. Most notably, NCR entered into a partnership with CEISMC and the Westside Future Fund that included \$1 million to support the CEISMC summer learning programs Summer Bridge, Summer PEAKS, and Horizons Atlanta at Georgia Tech. Over the next five years, Hollis students will have the opportunity to participate in all of these programs as part of the goal of year-round engagement.

Summer Bridge

Sparked by the acknowledgment of challenges in the transition from elementary to middle school, Georgia Tech's Summer Bridge was designed to provide rising sixth graders with the opportunity to continue STEM learning over the summer as well as signal a developmental change.

"One of the things we wanted to signal to the kids, because they are staying in the same building, was that middle school is special and that now [they] are going to have to change," DeStefano said. "...so what we tried to do in the summer school was to try to give them some self regulation, some self leadership skills, some study skills, some things that they would need to be a little more independent."

Tailored specifically for the needs of rising Hollis sixth graders, Summer Bridge incorporates group work on various STEM projects in addition to swimming and end of the week trips. During the first part of the summer, students participate in mathematics enrichment using Make Music Count, a program designed to engage students in mathematics through learning to play the piano. In addition, students were able to select one of three afternoon STEAM enrichment courses: Virtual Reality, Architecture, and Music Technology.

The second part of the summer focuses student instruction on the completion of an integrated STEAM project. This year students created robots based on the children's book, *The Wild Robot*. The entire 6-week summer program culminates with an overnight trip to the Rock Eagle 4H center, where students focus on team building and leadership development.

One of the largest focuses of the program was not only to incorporate elements of STEM into daily activities, but to provide an experience outside of the norm of a regular school program.

"The fact that they get to walk and not have to walk in a straight line, the fact that they get to pick what they eat for lunch because they are eating in the student center and get to pick who they want to sit with, all of that just grows an individual," said Dr. Tamara Pearson. "I feel like yes we are doing Math and we are doing English Language Arts and Robotics, but the bigger thing for me is letting them just be children."



“My favorite part of the camp was swimming. We did swimming lessons and that was fun. I had a good time playing with my friends and having fun with the teachers.”

Student
M.R. Hollis Innovation Academy

CEISMC Summer PEAKS

CEISMC Summer PEAKS (Programs for Enrichment and Accelerated Knowledge in STEM) are hands-on, interactive learning experiences for students of all ages. Summer PEAKS covers many different concepts pertaining to Science, Technology, Engineering, and Mathematics (STEM), and Summer PEAKS gives participants the chance to enhance their knowledge of these concepts through experiential STEM activities on campus at Georgia Tech.

Summer PEAKS is Georgia Tech's own variety of STEM focused summer programs that are open to the public. From STEM based activities such as learning to code with Dash and Dot to the creation of Artbotics, students as young as rising fourth graders and even students entering high school become exposed to a variety of new experiences that expand their knowledge of STEM.



100% of students reported that they would recommend Georgia Tech CEISMC Summer PEAKS to their friends.

STEM Partnership Impact

Twenty Hollis students were given full scholarships to participate in Summer PEAKS during the summers of 2017 and 2018. During the summer of 2018, six of those students participated in pre and post surveys. Their responses were on a scale of 1-5.

I feel good about myself when I do science.



I am eager to use my science knowledge in my future job.



I would like to take more technology classes in school than my school makes me.

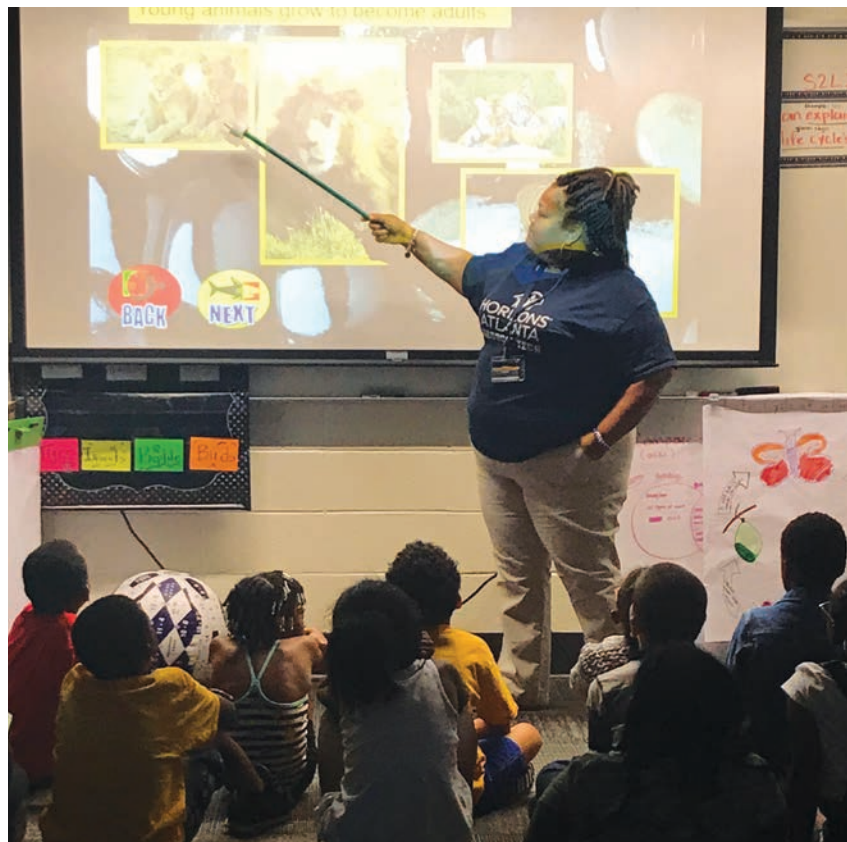


Horizons Atlanta at Georgia Tech

The mission of Horizons Atlanta at Georgia Tech is to provide an academic, cultural, and recreational program designed to encourage a diverse group of students from underserved communities to realize their full potential.

By working in partnership with families, Horizons at Georgia Tech serves students of varying academic abilities from an early age and continues to guide them throughout adolescence. Over the summer the Horizons program expanded to include scholars from Hollis and welcomed a group of sixteen rising first graders to the program as well as one Hollis teacher, LaKeesha Jones, to continue the tradition of hiring teachers from the host schools.

The Hollis students will remain in the program through their eighth-grade year and will be joined each year by a new group of ambitious rising first graders. During the school year, the Horizons program operates an afterschool program at Hollis. Weekly, the Horizons scholars, receive academic assistance and STEM-focused enrichment activities.



I am excited to welcome our sixteen rising first grade scholars and their families from Hollis to our Horizons family. I am looking forward to continuing our work with Hollis and supporting these scholars until they reach high school.

Sirocus Barnes, CEISMC
Horizons Atlanta at Georgia Tech

Full STEAM Ahead at School

Innovators in Residence

Modeled after the traditional artist in residence program, the Innovators in Residence program incorporates STEM professionals into the daily activities of Hollis classrooms. These individuals work with students on STEM projects and collaborate with teachers on planning, instruction, and technical support.

The first cohort of Innovators brought together a well-rounded group of individuals: Paulette Richards (Animatronic Puppeteer), Rachel Tierney (Computer Scientist), Ryan Snelling (Aerospace Engineer), and Kevin Arne (Civil Engineer and Master Woodworker). With a variety of STEM backgrounds and experience, the Innovators were the perfect bridge between industry professionals and classroom instructors with enough experience in education to cater to students and teachers.

The Innovators played a variety of roles in the school, from after-school program facilitation to in-class support, and worked with teachers and students on engaging STEM projects like Black Panther wearable technology, cardboard architecture, and modular robotics mazes for use with Spheros.

With any new position, there was a learning curve. As one Innovator noted, "There was a lot of learning the balance in this position, learning how much freedom we could have in the projects, especially when they have to meet a certain curriculum, they have to learn specific things." An entirely new approach to education mixed with the turnaround of a Westside school, there were bound to be hiccups in the process. However, as Innovators and teachers learned exactly what they were looking for and what they could get out of such a resource, the dynamic hit the ground running.

With an entirely new set of professional development opportunities, Hollis embraced the opportunities that came along with the presence of professionals in the STEM field. From aerospace engineering to animatronic puppeteering, the Innovators constituted a truly unique addition to the Hollis Innovation Academy.



Innovator in Focus

Rachel Tierney

Georgia Tech

Computer Science Major

Along with the other Innovators, Rachel collaborated with Hollis STEM teachers on various projects and activities throughout the year. From making cardboard mazes to navigate and program Sphero robots, to circuit playgrounds with the Black Panther wearable technology project, she enjoyed seeing kids pick up new skills and embrace challenging tasks as the year went by.

One of Rachel's favorite aspects of the Innovators in Residence position was the confidence that students developed from being involved in the STEM programs. "I think it gives confidence to kids that they can build something using their own creativity and knowledge...I think having the ability to do STEM like that, for future and for work, that's important but also because it's fun messing with this stuff. You can see in their eyes that they get really excited, so I think it really gives them a lot of confidence."

I was actually working with three kids who were working on an app inventor, and they were really excited and showed up on a day that I didn't think they were going to show up. It was one of the last days of school, and they were like "Where's Rachel? We need to work on this!"...They liked the idea that other people were going to use something they created. You can see in their eyes that they get really excited so I think it really gives them a lot of confidence.

Rachel Tierney
Georgia Tech



STEM Partnership Impact

The STEM teachers reported that the presence of the Innovators was the most beneficial aspect of the partnership with CEISMC, describing it as "a brilliant concept that needs to continue." Having the Innovators on the Hollis campus allowed the teachers to use them as a resource throughout the school day. Teachers reported that they interacted with the Innovators in some capacity almost every day of the week, often for multiple hours at a time. Because of their accessibility and flexibility, the Innovators were able to serve the school in a number of ways:

- Lesson Plan Support
- Designing STEM Activities
- Co-Teaching Classes
- Resources and Materials
- Troubleshooting Technology Problems
- Supporting After-School STEM Clubs

"They're not just in the building to be in the building. You can come in any day, and they're working with the children. They're working with us..., with the parents, with the teachers, and with the students."

~ Hollis STEM Teacher

Bring it Back to the Classroom



Teacher Professional Development

A major benefit of Hollis' partnership with CEISMC is priority access to a variety of STEM professional development opportunities. Below are examples of some of the professional development that Hollis teachers have participated in.

Code.org Computer Science Discoveries

July 2017 - Nichole Jones (STEM Teacher)

Computer Science Discoveries is appropriate for 6 - 10th grade students and takes a wide lens on computer science by covering topics such as programming, physical computing, HTML/CSS, and data. The course inspires students as they build their own websites, apps, games, and physical computing devices. As a Code.org regional partner, CEISMC offers professional development workshops each summer to teachers interested in bringing this course to their schools.

CEISMC Project-Based Inquiry Learning Course

January 2018 - Linda Howard (STEM Teacher), Marie Hall (5th Grade Teacher), Lorrae Walker (2nd Grade Teacher), Shakima Watson (1st Grade Teacher)

This instructor-facilitated online course supports teachers using project learning and sustainability concepts to enhance conceptual understanding, critical thinking, scientific reasoning, and problem solving. This innovative course immerses teachers in a sample PBIL experience and equips them with practical skills and tools to provide rich learning experiences that engage students and foster enduring learning. This course is co-facilitated by CEISMC.

STEM Teacher Leadership Program

June 2018 - Nichole Jones (STEM Teacher)

The STEM Teacher Leadership Program at Georgia Tech is sponsored by Honeywell and is comprised of four weeks of intensive summer training in software engineering and computing with 20 selected teachers from the metro-Atlanta area. Teachers gain access to Georgia Tech's state-of-the-art computing research and Honeywell engineers, who will serve as mentors and coaches. The STEM Teacher Leadership Program is facilitated by CEISMC in partnership with support from the School of Interactive Computing.

Infosys Pathfinders Conference - Art in Motion

July 2018 - Ronald Blache (Art Teacher)

Art in Motion is a project-based curriculum designed to authentically integrate computer science into art classes. Utilizing local art museums and galleries, students select inspiration pieces as the basis for moving robotic sculptures made using the Hummingbird Robotics Kit and programmed in Scratch. Students design and create their robots using strategies and processes used for any art project: sketching, journaling, revision, peer critique, etc. This program helps students, who don't normally see themselves as part of the computer science pipeline, broaden their view of themselves as potential coders. Teachers in this professional development learned everything they needed to know to be able to implement this authentic STEAM project back at their school. Dr. Tamara Pearson, from CEISMC, co-facilitated this workshop that hosted teachers from across the country.

Pi Academy

July 2018 - Nichole Jones (STEM Teacher)

Pi Academy is the Raspberry Pi Foundation's free face-to-face professional development program that supports educators throughout their digital making and computing journey. This two-day training event is held at venues around the UK and North America. After completing the program, educators join a community of passionate digital making practitioners. During the summer of 2018, Pi Academy was hosted on the campus of Georgia Tech in partnership with CEISMC.

The GIFT of STEM Teaching

Founded in 1991, the Georgia Intern Fellowship for Teachers (GIFT) program provides paid summer STEM internships in industry workplaces and university laboratories for K-12 science, mathematics, and technology teachers. Teachers spend four to seven weeks experiencing first hand how industrial scientists and researchers approach problems, design experiments, interpret data, communicate findings, and develop and implement workplace solutions. GIFT provides teachers with “real world” applications of the subjects they teach. This allows the educators to increase content knowledge and gain practical examples of science, technology, engineering, and mathematics in order to apply enriched instruction and teaching practices to the classroom. In summer 2018, two Hollis teachers were offered GIFT placements as a part of our partnership.



I am looking forward to bringing back the impact that project-based learning can have on our students and to help them build that stamina for being able to be given a project and be able to see it all the way through to the end.

Lorrae Walker
M.R. Hollis Innovation Academy

Lorrae Walker

Internship location: CEISMC - Georgia Tech

About Lorrae: Lorrae Walker teaches second grade at Hollis and is excited to bring back project-based learning to her second year at the school.

GIFT Internship: During Walker’s GIFT placement this summer with CEISMC, she focused on developing projects and pedagogical skills to bring back to Hollis in the upcoming school year. Through her work with the CEISMC staff and by observing students in several CEISMC programs, she developed a project focusing on pollination impacts in bee cultures. Using resources provided by CEISMC and those available at Hollis, Walker plans to direct her passion for project-based learning around the tranquility garden at Hollis and will encourage students to observe how adding pollinators affects the produce yield of a garden.

Sharon Williams

Internship location: Georgia Aquarium

About Sharon: Sharon Williams teaches 5th grade at Hollis and plans to bring back knowledge on real world STEM applications and to encourage her students to become more engaged in the next school year.

GIFT Placement: During Williams's GIFT placement this summer at the Georgia Aquarium, she interned with the educational department and received behind the scenes tours of various aspects of the aquarium including water filtration and care of the animals. After spending the summer working with various marine biology professionals, Williams plans to bring back real world applications of STEM and STEM careers to her students at Hollis. She plans to motivate her students by encouraging an increase in STEM applications to all classes and hopes she can encourage students to take what they have learned along with them as they advance into high school and college.



“I’m always looking for professional development opportunities. STEM is my passion, so when I heard that this would give me an opportunity to learn a little bit more about STEM in the real world I was like ‘great, I can take that experience back to my students and give them a real world application to see how it looks if they continue on a path of STEM.”

Sharon Williams, M.R. Hollis Innovation Academy

Looking Toward the Future



Amidst changes and progress, Hollis students and staff look forward to the future of the school, transforming experiences from the past two and a half years into a sustainable STEM culture. In the next year, the school hopes to not only embrace the changes coming with the building renovations but integrating STEM into all classrooms.

From project-based learning experiences in literacy to the diffusion of new ideas through the STEM ambassadors and Innovators in Residence, Hollis hopes to incorporate science, technology, engineering, and math into all aspects of its curriculum and continually push forward toward STEM certification.

While the partnership between Hollis and CEISMC has had an enormous impact on the development of the school and the revitalization of the Westside community, the full in-depth support will eventually begin slowing down. Hollis is well on its way to becoming an independent and sustainable school, which only opens the doors for progress.

“We know that we are not going to be [at Hollis] forever,” Dr. Lizanne DeStefano said. “We have sort of set ourselves a four-year timeline. Next year will be our third year of strong implementation and then the fourth year is kind of us taking a step back. We will still be there, but let the school sort of pick up and implement the things we have been guiding and fostering.”

We will be there to step in if things go awry, but we are seeing a diminished engagement in the fourth year. By the fifth year, they should be doing it themselves.”

In addition, with the precursors to school turnaround success comes the importance of modeling change. With scores, school involvement, and the development of a school-wide culture on the rise, documentation of this progress becomes ever more important.

“On our side, for our benefits, [our goal] is to have enough artifacts to be able to know how we did it,” Dr. Tamara Pearson said. “What I find a lot of times when I go to schools that are really amazing, they can’t remember how they got there. That’s why I think these reports are really important. Beyond it being an example of quality STEM programming, it is also an example of a mutually beneficial partnership.”

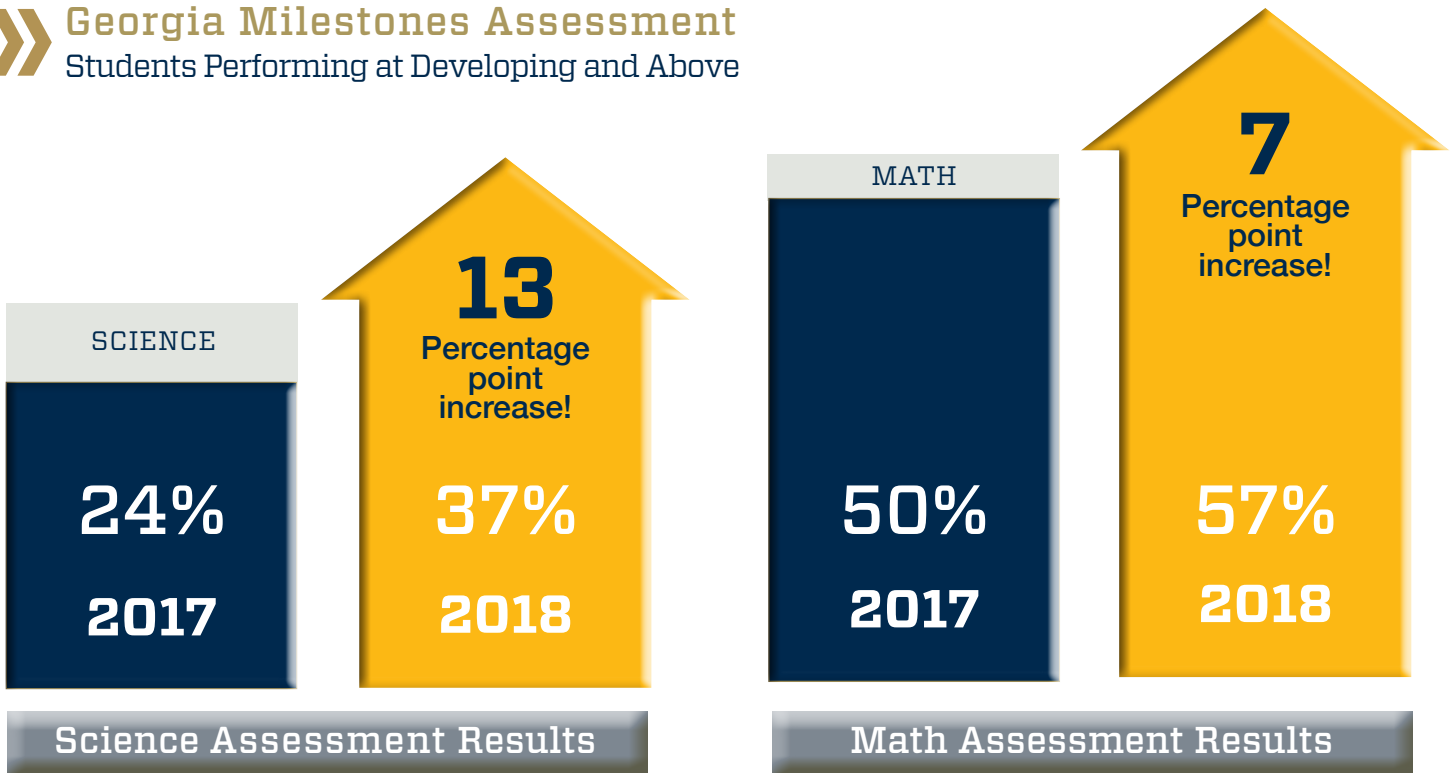
Even with indicators of success and a strong foundation in educational revival, Hollis is still constantly looking towards the future. “We see ourselves as ever-changing at Hollis. Your work is never done. You only stop working on projects you never finish them,” said Dr. Diamond Jack. “I myself being eight years principal, 18 years educator, I am not finished...I think it is a growth mindset that statement has embodied. You are in a constant cycle of learning and in a constant cycle of becoming better. Becoming the next.”



STEM Partnership Impact

Since opening its doors in 2016, Hollis has seen great improvements in student academic outcomes, which can be partially attributed to the engaging STEM curriculum and programs implemented through their partnership with CEISMC. There was a 7 percentage point increase in students performing “At Developing and Above” on the Georgia Milestones Assessment System Mathematics portion of the test and a 13 percentage point increase in the Science portion from 2017 to 2018.

» Georgia Milestones Assessment Students Performing at Developing and Above



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STEM Partnership Timeline

PHASE I

January 2016

Dr. Lizanne Destefano, CEISMC Executive Director, and Dr. Meria Carstarphen, APS Superintendent, discuss educational turnaround on the Westside.

March 2016

The Westside Turnaround Plan is officially approved. M.R. Hollis Innovation Academy is set to open for the 2016-2017 school year.

July 2016

The funding proposal is approved by The Blank Foundation and the CEISMC-Hollis partnership officially begins.

CEISMC and Hollis pre-plan for the year and develop the STEM curriculum.

August 2016

Hollis Opens

October 2016

Sources of Urban Educational Excellence Conference takes place at Georgia State. Dr. Tamara Pearson, Dror Yaron, Dr. Diamond Jack, and Ayana Gabriel host a panel about the partnership called "School, University and Community Collaboration: Creating a K-8 STEM Academy in Atlanta Public Schools".

February 2017

Hollis hosts STEM Night in collaboration with CEISMC.

March 2017

Hollis hosts the Nerdy Derby model car race.

June 2017

Georgia Tech hosts summer programs. Hollis students attend Summer Bridge and Summer PEAKS. Hollis teachers participate in GIFT.

PHASE II

August 2017

Hollis begins its 2nd school year and hosts its first 6th grade class.

October 2017

CEISMC places its first cohort of four Innovators in Residence at Hollis.

Fablearn takes place at Stanford University. Dr. Tamara Pearson presents about the Georgia Tech Summer Bridge Program.

December 2017

Westside Future Fund commits to \$1.2M partnership with NCR and CEISMC to support summer learning for Hollis students over the course of 5 years.

March 2018

CEISMC hosts Tinkering Workshop for Hollis STEM Ambassadors facilitated by Ryan Jenkins of the Wonderful Idea Company.

May 2018

Hollis and CEISMC host 2nd Annual Becoming the Next end of year awards.

June 2018

Hollis rising 1st graders participate in Horizons.

Hollis teachers participate in GIFT and STEM Teacher Leadership Program.

July 2018

Hollis students attend Summer Bridge and Summer PEAKS.

Hollis art teacher participates in Infosys Pathfinders Conference.

Hollis STEM teacher participates in Pi Academy.

August 2018

Westside Future Fund commits to an additional 2 years of funding for Phase 3 of Hollis partnership.

**Center for Education Integrating
Science, Mathematics and Computing
School & Community Engagement**

**M. R. Hollis Innovation Academy
STEM PARTNERSHIP PHASE II**

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