

2014 ANNUAL REPORT BALTIMORE'S STEM PIPELINE



Baltimore's STEM Pipeline

Dear Friends,

The Ingenuity Project, now in its 21st year, continues as the Baltimore City Public Schools' longest-standing accelerated mathematics and science program where very bright and motivated students can develop their interests and abilities, and satisfy their curiosity. Ingenuity provides a cohesive learning environment and culture of excellence that encourage students to challenge themselves as far as they can stretch their minds.

In summer 2014, The Ingenuity Project made an important transition in its leadership. The Board of Directors thanked long-time executive director Dolores Costello for her dedicated leadership over the past 10 years. Dolores' sound guidance during the preparation of Ingenuity's first strategic plan produced a working document that is repositioning the program to serve more students.

In June, Lisette Morris joined Ingenuity as its new executive director. Most recently, she was the knowledge management director in the Office of Achievement and Accountability in Baltimore City Public Schools. In this role, Lisette oversaw collaborative initiatives to improve information-sharing processes and use data-informed decision making in schools and district offices. She began her career as a teacher in Baltimore City Public Schools.

Lisette's priorities include:

- Providing opportunities for all middle school students to excel and be equally prepared for Ingenuity at Baltimore Polytechnic Institute;

- Building partnerships within school communities and with STEM (science, technology, engineering, and math) providers to increase student enrichment, achievement, and exposure to competition;
- Increasing collaborative learning across Ingenuity middle schools through group math and science events, such as the 8th Grade Rocket Launch;
- Diversifying research practicum options so that every high school student can pursue their interests in current and changing STEM fields and gain valuable exposure to a broad spectrum of careers;
- Providing vital development and support for our teachers to maintain Ingenuity's high standards, particularly during the transition to Common Core standards and assessments; and
- Using our proven record of achievement to expand access to advanced STEM education across Baltimore City.

Once again, we thank everyone for their support of The Ingenuity Project during this academic year. Baltimore City Public Schools and longtime foundation support from The Abell Foundation, Lockhart Vaughan Foundation, T. Rowe Price Foundation, and Thomas Wilson Sanitarium for Children have been integral to our success. We thank our parents and the community for their generous support.

We express gratitude to everyone who helped make this year so rewarding, and in particular to Ingenuity's staff; Dolores Costello, former executive director; Sergei Zverev, Ph.D., associate director; and Gale Fletcher, M.A., dean of students. The Board of Directors is grateful for their unstinting commitment, for our teachers, and for our hardworking students.

Very truly yours,



Gary R. Pasternack, M.D., Ph.D.
President

Ensuring that Baltimore City Public Schools cultivate a diverse group of STEM leaders who are at the center of tomorrow's great discoveries.



Northrop Grumman High School Innovation Challenge

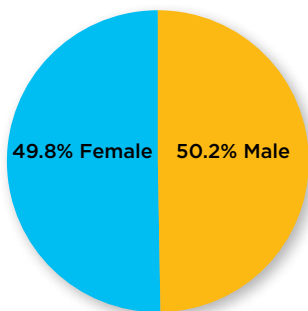
The Ingenuity Project's public/private partnership with Baltimore City Public Schools offers an unprecedented level of engaged learning. Ingenuity, hosted by three Baltimore City middle schools — Hamilton, Mount Royal, and Roland Park — and by Baltimore Polytechnic Institute,

gives highly motivated students an exceptional opportunity to master complex mathematics and science.

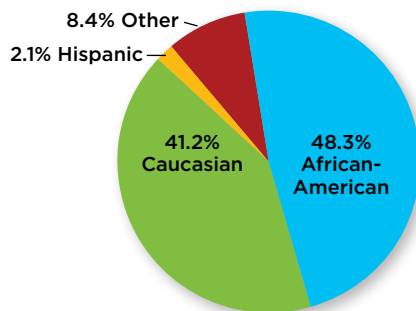
The impact of our culture of high achievement is demonstrated in 2013-2014, a banner year for student excellence. Students earned local, national and international recognition for their original research, achieved high

test scores and were accepted at the nation's most competitive colleges. The forty-one high school graduates earned close to \$9 million in scholarships. A hallmark of Ingenuity's program is that students learn to take control of their own education to prepare themselves for a rewarding future.

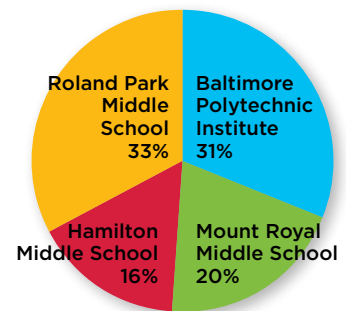
Ingenuity Project Student Demographics by Gender



Ingenuity Project Student Demographics by Ethnicity



Ingenuity Project Enrollment



Students represent a socio-economic group that includes 50 percent of students from African-American and Hispanic backgrounds, and program-wide, 38 percent eligible for a free or reduced lunch. Fifty percent of students are female. The program engages a range of families: Some have chosen to educate their children in Baltimore City Public Schools rather than send them to private schools, and some are preparing their children to become the first in the family to attend or complete college.



**Gabriel Grell, Poly Valedictorian,
Harvard College, Class of 2018** ▼



Research Practicum

In the Research Practicum, students foster their interests in science in a learning environment where they can act as scientists, mathematicians, and engineers mirroring what they will experience in college and in their STEM careers.

Students identify unanswered questions in selected STEM fields that are of genuine value to other scientists and relevant to solving real-world problems. They plan original research with the guidance of a mentor at one of the area's major scientific research or medical institutions. Students analyze their research data and transform information, collaborate with others across disciplines, and present findings to professional audiences and in peer-reviewed journals.

Each May, at a student-run symposium open to the community, students present and discuss their research findings. The following fall they submit their projects to the Intel Science Talent Search and Siemens competitions, the nation's most prestigious high school science competitions,

and to the Baltimore Science Fair. Grand Prize winners of the Baltimore Science Fair advance to the Intel Science and Engineering Fair, the premier global competition entered by 1,700 students from 77 nations. This year is the fourth consecutive year that an Ingenuity student advanced to the international competition and the 11th in the past 13 years.

Since its inception, enrollment in the Research Practicum has been an elective, with one-half of the high school students participating. Beginning next year, Ingenuity will introduce a broader array of research options to help students find their interests in a STEM field and be exposed to a broad spectrum of STEM careers, including data science and software coding. College admissions officials inform us that the capabilities and self-confidence of the Research Practicum students set them apart from other entering college students.

**Lucas Winch, Baltimore Scholar,
Johns Hopkins University, Class of
2018; and Kelly Khare, College Park
Scholar, University of Maryland,
Class of 2018** ►

Student Outcomes

Ingenuity High School Students Again Earn Widespread Recognition

Kelly Khare and **Lucas Winch** were named semi-finalists in the 2014 Intel Science Talent Search. Kelly Khare's project, "The Effect of Drainage Channels on the Peeling of a Surface Submerged in Fluid," also earned a 2nd place prize at the 2014 Baltimore Science Fair. She was mentored by Dr. Joelle Frechetter at Johns Hopkins University's Department of Chemical and Biomolecular Engineering. Lucas Winch — whose research is entitled, "Origins of Large Igneous Provinces (LIPs)" — conducted



A Selective List of 2014 College Acceptances

Ingenuity juniors and seniors receive in-house college counseling services to supplement that offered by Baltimore Polytechnic Institute.

American University
Boston University
Case Western Reserve University
Columbia University
Cornell University
Dartmouth College
Delaware State University
Duke University
Emerson College
George Washington University
Georgia Institute of Technology
Goucher College
Grinnell College

Harvard College
James Madison University
Johns Hopkins University
LaSalle University
Morgan State University
Muhlenberg College
New York University
Pennsylvania State University
Purdue University
Princeton University
Rice University
Stanford University
Tulane University

United States Naval Academy
University of California – Davis
University of Chicago
University of Connecticut
University of Maryland,
College Park
University of Miami
University of Pennsylvania
University of Richmond
University of Rochester
University of Virginia
Washington University in St. Louis
Yale University

his research at Johns Hopkins University’s Department of Earth and Planetary Sciences, and was mentored by Dr. Peter Olson. Kelly will attend the University of Maryland as a College Park Scholar with a major in chemical engineering; Lucas will attend Johns Hopkins University as a Baltimore Scholar.

Darius Johnson’s project, “Characterization of T Cell Receptor Clonotypes in an SIV Infected Pigtailed Macaque,” earned him the Grand Prize award at the 2014 Baltimore Science Fair in the Biological Sciences category. At the 2014 Intel Science and Engineering Fair, Darius’ research earned a 3rd place Grand Award in the category, Cellular and Molecular Biology.



Darius was recognized by the Bill and Melinda Gates Foundation as a 2014 Gates Millennium Scholar. This award will pay his tuition and expenses through the completion of a Ph.D. Accepted at every Ivy League college, Darius will attend Harvard College.

John Mountain won 2nd place at the Maryland Junior Science and Humanities Symposium and qualified to take the AIME, the only Poly senior to reach this level of the competition.

At the 2014 Baltimore Science Fair at Towson University, in addition to **Darius Johnson, Kelly Khare** won 2nd Place, Physical Science, and **Alexander Eusman** won Honorable Mention, Physical Science.

Twelve Ingenuity seniors were named Baltimore Scholars by Johns Hopkins University. Six selected Hopkins as their first choice and will receive four-year, full-tuition scholarships. They are **Tucker Chapin, Alexander Eusman, John Mountain, Shania Johnson, Evan Smith,** and **Lucas Winch.**

◀ **Darius Johnson, Harvard College, Class of 2018**



▲ **John Mountain (Johns Hopkins University, Class of 2018) won 1st Place in the Baltimore Metro STEM Competition**

Students named Advanced Placement Scholars are **Julian Brown, Mayah Dunstan, Gabriel Grell, Shania Johnson, Raphael Kargon, John Mountain,** and **Shamin Rahman.**

Victoria Jennings was named a Meyerhoff Scholar, and **Juliet Bishop, Mayah Dunstan,** and **Victoria Jennings** earned Benneker/Key Scholarships. **Rachel Baldwin, Juliet Bishop, Beatrix Edelenbos, Noah Gamper,** and **Darius Johnson** earned Presidential Scholarships.

“It was not until an administrator suggested that I take The Ingenuity Project entrance exam that the entire course of my education changed. I was accepted in the [middle school] program, ...and I began to see the world differently....I know that others like me are where we are now because we were lucky enough to have had doors opened for us and to have access to quality education.”

— ERICA PUENTES, UNIVERSITY OF MARYLAND, CLASS OF 2017.

Ingenuity’s 6th–12th Grade Continuum

The Ingenuity Project curriculum begins in 6th grade, and students who complete the span of the curriculum through 12th grade show the strongest readiness for college.



Middle schoolers collaborate to build their rockets

Middle school can be a time when students begin to think about what they want to do with their lives. Ingenuity students support one another’s joy of learning and discovery. A goal for the upcoming year is to bring in out-of-school STEM providers to the program to increase student enrichment, achievement, and exposure to competition.

Middle school mathematics begins with the Singapore Math curriculum in 6th grade to ensure a fundamental understanding of mathematical concepts. Students advance to pre-algebra in 7th grade and high school-level algebra I in 8th grade. Middle school math teachers develop the Ingenuity curricula to cover all Common Core State Standards and satisfy their high expectations to teach a broad, deep, and rigorous curricula.

The science curricula places a strong emphasis on the scientific inquiry process and investigation into scientific research. The curricula is: 6th grade earth and science (geology, weather, and astronomy); 7th grade — living things (biology); and 8th grade — physical science (physics and chemistry). Students work with their teachers early in the year to carefully design science projects that compete in the Morgan Science Fair. Students are required to maintain an 80 percent grade average to stay enrolled.

Middle school students also excelled in 2014 competitions. MathCounts, a year-round commitment, challenges students with complex math problems outside of the regular curriculum. At Roland Park Middle School, **Samuel Harkness** topped his peers as he advanced to the statewide competition.

Roland Park students were among the 110,000 students worldwide who participated in the Math Olympiads-MOEMS, an online competition. Fifteen students scored in the top 90 percent to 97 percent worldwide. They are 6th graders **Noah Tunnis** (who won the highest individual score), **Adam Hofert, Helen Schott, Fiona Zabel, Zachery Kent, Isaak Sharfstein, Tessai Watts,** and **Samantha Yoseph**. Highest scoring 7th graders are **Wilfred Tsung, Samuel Harkness,** and **Destiny Brown**. Eighth graders performing at the top levels were **Elias Schwartz** (highest scoring), **Joseph Evangelista, Luka Stefanovic,** and **Claire Wayner**.

The Johns Hopkins Center for Talented Youth evaluates the efficacy of the middle school program. This year, the results again show that middle school student achievement gains exceed typical levels of growth.

In addition, a Baltimore Education Research Coalition (BERC) report released November 2014 reveals that students who participate in Ingenuity in middle school, and attended high schools across the city, typically earn higher GPAs, have higher PSAT/SAT scores, and take more Advanced Placement courses in high school when compared to similarly matched students who did not participate in Ingenuity middle school.

All Ingenuity middle school graduates who continue in the public school system advance to citywide entrance criteria high schools. Of the graduates, 59 percent enrolled at Poly, and of those, 32 percent enrolled in The Ingenuity Project. Increasing the number of middle school students, particularly from Hamilton and Mount Royal middle schools, who apply and enroll in Ingenuity at Baltimore Polytechnic Institute is an organizational priority.



Teams are comprised of students from all three middle schools

The Annual 8th Grade Rocket Launch

The annual 8th Grade Rocket Launch is a hands-on learning project in which students develop their original ideas and apply their mathematics, science, and technology skills to create a working rocket according to certain specifications. The students' freedom to explore, investigate, and create makes this STEM project fun.

It encourages collaborative learning as student teams form, each with representatives from all three middle schools. Teams plan their rocket launch electronically before meeting at Poly on launch day. Hands-on projects are designed to encourage 8th graders to apply to Ingenuity at Poly where science is interactive with real-world science experiments.



**The Ingenuity Project
gratefully acknowledges
the following contributions
received during the 2013-2014
school year:**



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Baltimore City Public Schools
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Peter, Caroline, Claire & Charlie Wayner



**Celebrating Achievement in Science, Technology,
Engineering and Mathematics, April 29th at the
Frederick Douglass-Isaac Myers Maritime Park Museum.
Our speaker, Dr. Joshua Scharfstein is the Secretary of
the Maryland Department of Health & Mental Hygiene.**

Thank you to our generous sponsors:

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Johns Hopkins University
Stevenson University
Towson University
T. Rowe Price Associates
University of Maryland at Baltimore County
Loyola College

Statement of Financial Position, June 30, 2014 and 2013*

| | <u>2014</u> | <u>2013</u> |
|---|-------------------------|-------------------------|
| ASSETS | | |
| Cash | \$142,410 | \$113,136 |
| Certificate of Deposit | — | — |
| Grants Receivable | 47,038 | 30,846 |
| Prepaid Expenses | 9,516 | — |
| Net Property and Equipment | <u>74,446</u> | <u>68,675</u> |
| Total Current Assets | <u>\$273,410</u> | <u>\$212,657</u> |
| LIABILITIES | | |
| Deferred Revenue | — | — |
| Accounts Payable | \$5,991 | \$8,238 |
| Accrued Salaries | <u>25,235</u> | <u>14,655</u> |
| Total Current Liabilities | <u>\$31,226</u> | <u>\$22,893</u> |
| NET ASSETS | | |
| Unrestricted | \$242,184 | \$189,764 |
| Total Liabilities and Net Assets | <u>\$273,410</u> | <u>\$212,657</u> |

STATEMENT OF ACTIVITIES, JUNE 30, 2014 AND 2013

| | <u>2014</u> | <u>2013</u> |
|---|---------------------------|---------------------------|
| REVENUES AND OTHER SUPPORT | | |
| Baltimore City Public School System | \$368,000 | \$368,000 |
| The Abell Foundation | 500,000 | 485,000 |
| Foundation and Corporate Grants | 88,500 | 89,430 |
| Other Revenue | <u>158,064</u> | <u>100,319</u> |
| Total Revenues and Other Support | <u>\$1,114,564</u> | <u>\$1,042,749</u> |
| Expenses | | |
| Program Services | \$840,957 | \$831,958 |
| Management and General | 193,604 | 192,274 |
| Fundraising | <u>27,583</u> | <u>28,738</u> |
| Total Expenses | <u>\$1,062,144</u> | <u>\$1,052,970</u> |
| Change in Net Assets | 52,420 | (10,221) |
| Net Assets at Beginning of Year | <u>189,764</u> | <u>199,985</u> |
| Net Assets at End of Year | <u>\$242,184</u> | <u>\$189,764</u> |

*Above are selected components from the 2014 audited financial report.

Total student enrollment: 534

Cost per student: \$2,004

Stephon Jackson, T. Rowe Price Associates, explains wealth management to Poly students



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