

Finding The Future

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Dear Friends,

The Ingenuity Project is pleased to share this report of a highly successful 2015-2016 academic year. We are proud of our students' academic growth and deeply respectful of their dedication to the program's rigors. Many graduates of the class of 2016 are attending the nation's most competitive universities.

During this school year, Ingenuity's leadership assessed its current impact and developed a bold new strategic plan. By 2020, our aspiration is to increase the number of high-ability students from underserved communities enrolled in The Ingenuity Project and accepted to selective colleges.

To achieve that aspiration, Ingenuity will be developing new strategies to recruit and enroll more students from all Baltimore zip codes and from elementary schools where students have not historically been identified for the opportunity to enroll in Ingenuity. We will expand the number of students served, while continuing to innovate STEM instruction and provide the most exemplary accelerated math and science curriculum, enrichment, and support possible.

Implementation of this important priority is a team effort. We could not succeed without our master teachers who prepare students with rigor and high expectations. We thank our many friends and supporters who make the program possible for students across the city. We also could not succeed without the commitment of our parents who steadfastly support their children as they navigate Ingenuity's demanding coursework.

Sincerely,

Ben Yuhas, Ph.D. President

Ben Jula Disette AMorias

Lisette S. Morris, M.S. **Executive Director**



PROCED

OUR MISSION

To prepare and launch the next diverse generation of nationally competitive STEM (Science, Technology, Engineering, and Mathematics) leaders in Baltimore City Public Schools.



OUR PROGRAM

The Ingenuity Project, a non-profit organization, is a joint effort of the Baltimore City Public School System, the Abell Foundation, and Baltimore's science and mathematics community. The Ingenuity Project is the only comprehensive, advanced math and science instructional program for gifted and advanced children in grades 6-12 in Baltimore City that has positive, demonstrated student achievement outcomes. Ingenuity's math and science curriculum is not a supplement to existing math and science instruction, but a year round, comprehensive math and science curriculum.

Ingenuity is committed to recruiting and cultivating students with high potential and interest in STEM from historically underserved populations to ensure the program reflects the ethnicity, gender, and income of Baltimore City households.

WHAT WE DO

- Recruit, select, and place high ability students into accelerated math and science cohorts
- Develop and refine accelerated math and science curriculum and supplemental resources
- Support a community of teachers to become experts in teaching accelerated math and science curriculum
- Advise students on college selection and application process

WHO WE SERVE

In school year 2015-2016, 591 Baltimore City Public School students in grades six to 12 enrolled in The Ingenuity Project. Program wide, 50% of the students are female, over 50% are



African American or Hispanic, and 38% receive free or reduced meals at school. Students come from all 31 zip codes across the city. The program is hosted by three middle schools – Hamilton (68), Mount Royal (107), and Roland Park (192) – and a single high school, Baltimore Polytechnic Institute (224).

2016 HIGHLIGHT

NOBEL LAUREATE VISITS WITH STUDENTS AT HOPKINS

Nobel laureate Dr. Randy Schekman a professor in the Department of Molecular and Cell Biology, University of California, Berkeley, and an investigator of the Howard Hughes Medical Institute visited Maryland as part of the Nobel Prize Inspiration Initiative and met with a group of Ingenuity Poly students.

Cultivating Nationally Competitive Students in Middle School

Each year Ingenuity evaluates the effectiveness of its curriculum, instruction, and other supports by monitoring student progress in math and science. In the 2015-2016 school year, Ingenuity middle school students took the following pre- and post-tests: i-Ready math in grades six to eight, Northwest Evaluation Association Measures of Academic Progress (NWEA MAP) algebra I MAP in 8th grade, and NWEA MAP science in grades six to eight. Findings from these pre- and post-tests demonstrate Ingenuity's instructional program is supporting students' growth beyond national averages.



Teachers are retained for expertise within their subject areas. They provide daily instruction with after-school and summer programs to support mastery, retention, and a passion for math and science.

> Ingenuity eighth grade students show significant gains in Algebra I over the course of the year and are some of the top performers nationally in math. Algebra is an important foundation of the Ingenuity middle school math curriculum. It helps students develop abstract thinking and symbolic representation, which plays a critical developmental role in all STEM fields.



MARYLAND MATHCOUNTS CHAPTER COMPETITION 38 teams participated in the competition. Ingenuity at Roland Park Mathcounts team won ninth place. Coaches: Mrs. Schwartz, Mrs. Spicinetskiy, and Mrs. Ross. Team members: Sixth graders Nico del Pino and Evan Rowland Seymour; seventh graders Wayne Nelms and Seth Chng-Lin; eighth graders Colton Ross, Gerson Kroiz, and Katharina Krstic. Katharina, Colton, Gerson, Wayne, and Seth advanced to the Mathcounts state competition.

8TH GRADE ALGEBRA I (2015-16) PERCENT AT OR ABOVE 90 AND 97TH PERCENTILE



Assessments reveal Ingenuity's ability to cultivate gifted learners.

SCIENCE & MATH (2015-2016)



2



Expanding Innovative STEM Curriculum in Baltimore City Middle Schools

In the 2015-2016 school year, Ingenuity and the Baltimore Polytechnic Institute launched the STEM Capstone Challenge, a novel seventh and eighth grade science initiative. Initially funded through a nationally competitive grant by the Jack Kent Cooke Foundation, the project was further supported by the following local foundations: **Robert W. Deutsch Foundation**, **Northrop Grumman Foundation**, **Remmel Foundation**, **Alvin and Fanny B. Thalheimer Foundation**, and **Thomas Wilson Sanitarium**.

Program's Intended Outcomes:

- → Promote understanding of STEM careers;
- Develop interest among students from low-income backgrounds in advanced academic choices in high school; and
- Cultivate a network of teachers who identify high-potential students across the city.



"I THINK IT WAS FUN TO LEARN BY ACTUALLY MAKING A PROTOTYPE INSTEAD OF READING FROM WORKSHEETS OR A TEXTBOOK."

-Participating Seventh Grade Student

Special Hawks to: The Chesapeake Bay Foundation for providing educational resources for our teachers and a Chesapeake Bay trip for the winning teams and Harbor Designs and Manufacturing, FLAVORx, Court Grabbers, and Riley Educational Development and Innovations for presenting engineering designs for innovative products to inspire students at the project's kickoff.



Left: Seventh grade students at Mount Royal design their solution. Above: Science teachers collaborate in design of the Capstone: Rogie Legaspi (Ingenuity at Hamilton), Spencer Hicock (Advanced Academic at Roland Park), and Brian Thomas (Thomas Jefferson)

FUNDAMENTAL

QUESTION ADDRESSED: How can Baltimore City improve its infrastructure to prevent and reduce the amount of nitrogen reaching the Chesapeake Bay?

Working in teams, students used the engineering design process to create physical solutions to this local environmental challenge.

The initiative was designed to inspire more students across the city; particularly high-achieving, low income students, to apply and enroll in advanced programming offered by The Ingenuity Project at Baltimore Polytechnic Institute.

PARTICIPATION

The program was offered to more than 500 students from the following Baltimore City Middle Schools:

- ➔ Ingenuity at Hamilton Elementary/ Middle School
- → Ingenuity at Mount Royal Elementary/Middle School
- → Ingenuity @ Roland Park Elementary/Middle School
- Advanced Academics at Roland Park Elementary/Middle School
- → Tunbridge Charter School
- Thomas Johnson Elementary/ Middle School
- → Thomas Jefferson Elementary/ Middle School
- → Lakeland Elementary/ Middle School
- → Cross Country Elementary/ Middle School
- → The Mount Washington Elementary/Middle School
- Hampstead Hill Academy

Research Practicum— Incubating STEM Leaders

The Ingenuity Research Practicum is a three-year program that spans sophomore through senior years and serves as an incubator for future scientists, engineers, and mathematicians. During the Research Practicum experience, students work with mentors at local colleges, universities, and other research institutions to develop independent research projects. Students contribute to the body of research and, in some cases, have their work acknowledged in scientific papers. They are required to submit their work to national pre-college competitions. For some, this will mean entering the Siemens Competition and the Regeneron (formerly Intel) Science Talent Search; two of the nation's most prestigious and financially rewarding contests. Juniors and seniors submit their research to regional science fairs as well. Almost every year, one to two students receive first-place category awards at the Baltimore Science Fair, which qualifies them to compete at the Intel International Science and Engineering Fair with 1,800 students from more than 75 countries.

🙀 DID YOU KNOW?

+ More than 20 students have co-authored papers in peer-reviewed journals or publications.

+ In Ingenuity's history, close to 70 percent of students' research is conducted in (Johns Hopkins University labs.

KATHY LE, A SENIOR AT BALTIMORE POLYTECHNIC INSTITUTE AND A MEMBER OF THE INGENUITY PROJECT, WAS SELECTED AS A NATIONAL SEMIFINALIST IN THE 2016 INTEL SCIENCE TALENT SEARCH.

As part of the Ingenuity Research Practicum, Kathy's research was about stem cell competition in relation to genetic disorders and aging. // Kathy did her work at the Johns Hopkins School of Medicine Department of Cell Biology and was mentored by Dr. Erika Matunis and Leah Greenspan. // The announcement of 300 high school seniors named as semifinalists in the Intel Science Talent Search 2016, a program of Society for Science and the Public, was made on January 6, 2016. Each semifinalist receives a \$1,000 award from the Intel Foundation with an additional \$1,000 going to his or her school. Semifinalists were selected from more than 1,750 entrants hailing from 512 high schools throughout 43 states; Puerto Rico; Washington, D.C.; and six American and international high schools overseas.



TEACHER SPOTLIGHT

David Nelson has been Ingenuity's Research Coordinator for 13 years. Each year, David coordinates with **Batlimore's scientific** community to match dozens of students with quality research placements. He has helped produce many Intel semifinalists and regionally recognized students at the Baltimore **Science Fair. This role** has required David to expertly guide students in navigating a wide range of professional research settings. These skills prepare students well for a strong future.



Continuing the Legacy of Student Achievement and Recognition



The entire Ingenuity Class of 2016 will be attending college. Students have been accepted to the following universities (among others): Boston University, Brown University, Bucknell University, Cornell University, Deep Springs College, Dickinson College, Emory University, Gettysburg College, Johns Hopkins University, Lafayette College, Northeastern University, Reed College, University of

California Los Angeles, University of California San Diego, University of Chicago, University of Maryland College Park, University of Pennsylvania, University of Virginia, Washington University in St. Louis, Yale University

SAT and SATII Test Scores	Ingenuity Average	Maryland Average	US Average
SAT Mathematics	692	508	541
SAT Critical Reading	665	494	543
SAT Writing	638	482	482
SAT II Biology (taken at the end of 9th grade)	661	628	616
SAT II Physics (taken at the end of 10th grade)	589	672	667
SAT II Math (taken at the end of 10th grade)	635	603	599

Percentage of students scoring a 4 or 5 on AP exams:



SENIOR TRAVELS TO ARIZONA FOR INTEL

competed with 1,700 students from across the world.

Statewide: In 2016, 58.77% passed AP exams.

KEY STATISTICS

- 1 Semifinalist in the Intel Science Talent Search
- 1 first place in Physical Sciences category at the Baltimore Science Fair. Winner went on to compete at the Intel International Science and Engineering Fair
- 22 students received a total of 34 special awards at the Baltimore Science Fair
- Second and third place at the Maryland Junior Science and Humanities Symposium: Students went on to compete at the national level.
- 1 Baltimore City winner in the University of Maryland College Park High School Mathematics Competition
- 6 Johns Hopkins University
 Baltimore Scholars
- 3 Johns Hopkins University Future Scholars in Mathematics
- 2 Carson Scholars
- 1 Jack Kent Cooke Scholar
- 4 University of Maryland College Park Banneker/Key and Honors College Scholars
- 1 University of Maryland Scholar
- 1 University of Maryland Baltimore County Meyerhoff Scholar,
 1 Honors College Scholar, and
 1 Sondheim Public Policy Scholar
- 1 Penn State Schreiver Honors College Scholar

2016 HIGHLIGHT



INTERNATIONAL SCIENCE AND ENGINEERING FAIR Alex Hilger earned first place in the physical sciences category at the Baltimore Science Fair for his systems engineering project, "Drones Equipped with LiDAR for 3D Mapping". At IESF, he

Donor List

Foundation and Government Support

Abell Foundation Baltimore City **Public Schools** Robert W. **Deutsch Foundation** Middendorf Foundation Goldseker Foundation Lockhart Vaughan Foundation T. Rowe Price Foundation The Aaron & Lillie **Strauss Foundation** The Jacob and Hilda Blaustein Foundation Joseph and Harvey Meyerhoff Family **Charitable Funds** The Alvin and Fanny **B** Thalheimer Foundation The Thomas Wilson Sanitarium Society for Science and the Public Northrop Grumman **Remmel Foundation**

Idea Summit Sponsors

Whiting Turner Contracting Johns Hopkins University Whiting School of Engineering Baltimore Polytechnic Institute Foundation BGE, An Exelon Company CareFirst BlueCross BlueShield Johnson, Mirmiran and Thompson, Inc. (JMT) Johns Hopkins University Center for Talented Youth (CTY) Roland Park Civic League Towson University

The University of Maryland Foundation (UMBC) T. Rowe Price Associates Kurt and Evynn Overton Rosenberg Martin Greenberg

\$5,000 - \$10,000

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\$500 - \$999

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\$200 - \$499

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Up to \$199

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Statement of Financial Position

JUNE 30, 2016 AND 2015

	2016	2015
ASSETS		
Cash	\$221,971	\$291,881
Certificate of deposit	-	-
Cash restricted	-	-
Accounts receivable	-	-
Grants receivable	\$217,876	\$148,153
Prepaid expenses	\$9,986	-
Net property and equipment	\$47,344	\$67,931
Total Curret Assets	\$497,177	\$507,965
LIABILITIES		
Deferred revenue	-	-
Accounts payable	\$2,731	\$10,157
Accrued salaries	\$8,706	\$6,819
Total Curret Liabilities	\$11,437	\$16,976
NET ASSETS		
Unrestricted	\$370,740	\$320,989
Temporarily restricted	\$115,000	\$170,000
Total Net Assets	\$485,740	\$490,989
Total Liabilitiees and Net Assets	\$497,177	\$507,965
STATEMENT OF ACTIVITIES		
JUNE 30, 2016 AND 2015	2016	2015
Revenues and Other Support		
Baltimore City Public School System	\$368,000	\$368,000
The Abell Foundation	\$450,000	\$500,000
Foundation and corporate grants	\$301,500	\$370,188
Other Revenue	\$171,179	\$135,850
Total Revenues and Other Support	\$1,290,679	\$1,374,038
Expenses		
Program services	\$1,068,577	\$895,249
Management and general	\$192,316	\$187,524
Fundraising	\$35,035	\$30,836
Total Expenses	\$1,295,928	\$1,113,609
Loss on Disposition of Property	-	\$(11,624)

 Change in Net Assets
 \$(5,249)

 Net Assets at beginning of Year
 \$490,989

 Net Assets at End of Year
 \$485,740

\$248,805

\$242,184

\$490,989

Ingenuity Alumni Fulfilling the Mission In 2015, we surveyed alumni from 2001 to present. Approximately

In 2015, we surveyed alumni from 2001 to present. Approximately 25 percent of alumni completed the survey. The survey confirmed the extent to which Ingenuity is launching and preparing the next diverse generation of STEM leaders from Baltimore City.



FEATURED ALUMNI IN STEM CAREERS



EBONY LARRY (Class of 2009)

Ebony earned a B.S. in Civil Engineering from Morgan State University. She is an associate engineer at Pennoni Associates, Inc., where she works in the Civil-Municipal Division and designs water distribution systems and pumping stations for Baltimore City and other surrounding jurisdictions.



TENO BOONE (Class of 2009)

Teno is a scientist engineer at Proctor & Gamble, currently working in Southwest Georgia, where he leads full-scale process development of new product initiatives. Teno holds a B.S. in Chemical and Biomolecular Engineering from Johns Hopkins University.



enrolled in a 4-year university

within 1-year

graduating

ERIC ROSENBERG (Class of 2004)

Eric is a physician, working as an Ophthalmology Resident at Westchester Medical Center in Valhalla, NY. He holds a B.S. in Bioengineering from Lehigh University, an M.S. in Bioengi-neering from the University of Pennsylvania, and a D.O. in Medicine from the New York Col-lege of Osteopathic Medicine. He is the co-founder and CEO of EveMedia. LLC. He wrote a book with Spring Publishing, an internationally renowned medical publisher. His book, Operative Dictations in Ophthalmology, is currently on shelves.



99%

ELA-SITA CARPENTER (Class of 2001)

Ela is a second year PhD student in the Fisheries & Wildlie Science PhD program at the University of Missouri. Her dissertation research will be focusing on urban ecology, specifically bats, and how different ecological and human factors determine what bat species are present in Baltimore City. Ela holds a B.S. in Biology from Hampton University and earned an M.S. in **Environmental Science** from Christopher Newport University.

Baltimore Ideas Empowered

Ingenuity's second Idea Summit was held on April 20, 2016 at the American Visionary Arts Museum. Thirteeen Ingenuity students and alumni delivered TED-style talks designed to foster inspiration, learning, and wonder and promote conversations that matter. The event was attended by over 350 guests.





IDEA SUMMIT 2016 SPEAKERS AND TOPICS:

Marlena Milic

Ilth grade Ingenuity student at Poly A Native vs. A Nation: The Country's Perception of Baltimore

Duane Dennis

Ingenuity/Poly Alumnus, Class of 2010 Innovation in a World of Automation

Claire Wayner

10th grade Ingenuity Student at Poly Changing the Dream of the North: Climate Change and its Inevitability

Sydney Worsham

11th grade Ingenuity Student at Poly Baltimore and China: Learning from Each Other

Sarah Bowden

11th grade Ingenuity Student at Poly *Birth Defect...Or Is It?*

Wayne Nelms, Jr. 7th Grade Ingenuity

Student at Roland Park Elementary/Middle School The Science of Procrastination

Jordyn Blanding 8th grade Ingenuity Student at Mt. Royal Elementary/Middle

Elementary/Middle The Healing Powers of Kinesio Tape

Lily DeBell

9th Grade Ingenuity Student at Poly The Transformative Power of Entrepreneurship Education

Jasmine Long

11th grade Ingenuity Student at Poly Strong, Intelligent, and African-American

Hannah Greene

10th grade Ingenuity Student at Poly *STICK-to-itiveness*

board

Harry Huntley and

Thomas Heck 12th grade Ingenuity Students at Poly Aquaponics: Life in the Mouth of a Tilapia

Above: Middle and high school TED speakers Left to right: Speaker and alumnus Duane Dennis; Student speaker Jordyn Blanding with parents and younger sister; educators Marc and Shannen Siciliano; members of Ingenuity's

Abe Davis

Ingenuity/Poly Alumnus (Class of 2006) Interactive Dynamic Video: Using Cameras to Capture Objects in a New Way

WELCOMING HOST, DR. LEANA WEN, KICKED OFF IDEA SUMMIT WITH A POWERFUL OPENING TALK TO THE GUESTS. HER PERSONAL STORY RECEIVED A STANDING OVATION.

As Baltimore City's Commissioner of Health, Dr. Wen leads the oldest, continuously-operating health department in the U.S., with more than 1,000 employees. Her transformative approach to public health involves engaging hospitals and training citizens in violence prevention and launching an ambitious opioid overdose prevention program, which is training residents to save lives. Following the civil unrest in April 2015, she directed Baltimore's medical access and trauma recovery efforts.



"THE INGENUITY PROJECT DOES IMPORTANT WORK EXPANDING OPPORTUNITY TO BALTIMORE'S STUDENTS, WHOSE BRILLIANCE IS TOO OFTEN UNDERDEVELOPED. IF BALTIMORE IS GOING TO COMPETE AND SUCCEED IN THE 21ST CENTURY ECONOMY, THEN WE NEED TO PREPARE ITS YOUNG PEOPLE TO BE LEADERS IN THAT ECONOMY, WITH SKILLS IN HIGH-GROWTH FIELDS ROOTED IN THE SCIENCES AND MATHEMATICS."

-Ingenuity Project parent Alec Ross, author of The New York Times bestseller, The Industries of the Future

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Francis Arquiza-Eccles High School Math Teacher

Felicity Ross Middle School Math Teacher

Susan Lyons Middle School Math Teacher David Nelson Research Coordinator

Alka Sharma Middle School Math Teacher

Maya Spicinetskiy Middle School Math Teacher



The Ingenuity Project, 1400 West Cold Spring Lane, Baltimore, MD 21209 410.662.8665 phone • 410.662.8674 fax • www.ingenuityproject.org