P-TECH 9-14 SCHOOL MODEL

P-TECH is an innovative grades 9 to 14 public school model with a clear pathway from high school to college and career for students from all academic backgrounds. In six years or less, P-TECH students, who are not screened for admission, graduate with a high school diploma and a no-cost, two-year associate degree connected to a growth industry. Each P-TECH school works with a corporate partner, a local community college and school district to ensure an academically rigorous and economically relevant curriculum. Hallmarks of the program include one-on-one mentoring, workplace learning, structured workplace visits, skills instruction, paid summer internships and first-in-line consideration for job openings with the school's partnering company.

P-TECH graduates are fully prepared to begin successful careers in the 21st century workplace, continue their educations at the four-year college and university level and beyond, or both. Currently, the replicable and sustainable P-TECH model encompasses a network of almost 60 schools, serving thousands of students across six states in the U.S. and Australia. Together, these schools are spearheading an international effort to reform and revitalize career and technical education (CTE).

Why P-TECH Matters
P-TECH matters because college completion rates are far too low, and current Career and Technical Education (CTE) programs are often disconnected from the demands of industry. Meanwhile, there are 28 million "middle-skill jobs" – jobs that require an associate degree or similar technical training shy of a four-year degree – with 14 million additional jobs to be added by 2018. The fastest growing and highest paying jobs are those requiring proficiency in STEM (science, technology, engineering, math) fields. But less than one-third of U.S. students are adequately prepared for STEM careers, and college completion rates in these fields are in the single digits.

While U.S. high school graduation rates have improved markedly, postsecondary completion rates and the quality of skills training have not. More than half of U.S. community college students require remediation, and less than 25 percent of them will earn a certificate or degree within eight years. For low-income Americans and young people of color, remediation rates are much higher and completion rates much lower. Without postsecondary degrees and middle-skills job training, these young people are relegated to part-time jobs, limited benefits, and wages less than $15 per hour, all of which contribute to growing rates of income inequality.

P-TECH was designed to help break the cycle of poverty and address skills gaps in the labor force by preparing young people from all backgrounds for academic achievement and middle-class employment. In 2011, IBM, along with the New York City Department of Education and The City University of New

York, created a program that would link education to economic development and create a pathway from high school to college and career.

9-14 Model Tenets and Featured Components

- Each P-TECH school is a collaboration among a school district, a community college and an industry partner to ensure a rigorous curriculum that maps directly to job market needs.
- P-TECH students, who demonstrate that they are college ready, take full-credit college courses beginning in the summer between grades 9 and 10. High school and college courses are integrated, with each student moving at his or her own pace. Graduates earn their high school diploma and a two-year associate degree from their school's college partner.
- P-TECH schools map their curricula directly to 21st century labor market demands. Each P-TECH student has a mentor and benefits from workplace learning curriculum, workplace visits and paid internships. Successful graduates are "first in line for jobs" with the school's industry partner.
- P-TECH schools are "open admission" public schools, meaning there is no testing for admission. Because the model serves primarily historically underserved young people, the associate degree is provided at no cost to the student or their families.

A Model for Replication

The first P-TECH school opened in Brooklyn, New York in September 2011, as a collaboration among IBM, the New York City Department of Education, The City University of New York and the New York City College of Technology ("City Tech"). At the end of 2016, there were 55 P-TECH model schools nationwide across six states: New York, Illinois, Connecticut, Maryland, Colorado and Rhode Island. P-TECH is being implemented globally with two schools in Australia. Further replication is under way with new schools opening in 2017 in the US, Australia and Morocco.

The Playbook: www.ptech.org

IBM developed the P-TECH 9-14 School Model Playbook (www.ptech.org) to serve as the central hub for public-private partnerships interested in learning about and implementing this groundbreaking model. The site provides action-oriented guidance and tools, including case studies, to enable public-private partnerships to implement the model effectively and with fidelity.

P-TECH Graduates and IBM Hires

The first P-TECH school, P-TECH Brooklyn, is now in the final year of the six-year model and given its current stage of development, is the only school with graduates. As of January 2017, 54 students graduated within 5.5 years or less with *both* their high school diploma and their STEM AAS degree.

Eight graduates are currently working at IBM. These new hires are working in a variety of business units within IBM, including Digital Business Group, Market Development & Insights and IBM Global Financing.

Select Media

- P-TECH: The School That's Taking Over the World. *Black Enterprise*, August 7, 2015
- Educating Technologists. *The Economist*, July 16 2015
- Why IBM's CEO Is Hiring Teens. CNN, July 15, 2015
- From High School Calculus Straight to a Job at IBM. *FastCompany*, June 18, 2015
- The Reinventing of the American High School. *National Journal*, August 28, 2014
- Why Six Years for High School is Catching On. *PBS NewsHour*, April 9, 2014
- The School That Is Changing American Education. *TIME* Magazine, February 13, 2014

SNAPSHOTS FROM IBM'S SIX U.S. P-TECH SCHOOLS

P-TECH Brooklyn, New York
In September 2011, P-TECH Brooklyn became the first P-TECH school to launch.

Leadership and Staff
- Founding Principal: Rashid Ferrod Davis
- 30 teachers, 3 assistant principals, 3 guidance counselors, 1 business manager, 1 parent coordinator, 4 central office staff, and full-time liaisons from City Tech and IBM

Student Profile
- 573 total student population
- 74% boys; 26% girls
- 96% Black or Hispanic
- More than 70% of students qualify for free or reduced lunch
- 16% of students have Individualized Education Programs (IEPs)
- Average attendance rate is 93%

Academic Achievements
- Teacher attendance is 99%

- By August 2017, 88 students will have graduated within 6 years or less (as few as 3.5 years) with *both* their high school diploma and their STEM AAS degree.

- 56% of students from the first cohort of students graduated within six years with both their high school diploma and their AAS STEM degree, more than four times the national on-time community college graduate rate, which stands at 13%.

- Out of the 54 Brooklyn students who already graduated:
  - 10 graduates started working at IBM, most continuing toward a four-year degree while working. These new hires are working in a variety of business units within IBM, including Digital Business Group, Market Development & Insights and IBM Global Financing.
  - 25 are pursuing bachelor's degrees full-time
  - 15+ students are applying to four-year universities
  - 2 enlisted in the military

- P-TECH students place into credit-bearing college courses when ready – as early as the Spring of grade 9, and do not take remedial courses. High school and college coursework is integrated into a career readiness strand, which includes workplace learning curriculum, mentoring and skills-based internships, that provides students with the employability skills required for both college and career success.
  - Through August 2017, 310 students completed college courses. Eighty-two percent (82%) are in good academic standing by college standards.
  - Over 88% of high school graduates in 2015 met college-ready benchmarks known in New York State as "Adjusted Measures of Performance" or APMs. P-TECH was the only unscreened school (with no testing or grade requirements) in the top 20, ranking #14 out of all 372 high schools with APMs. P-TECH ranks #3 out of 221 high schools – screened and

unscreened – with APM data for black students.

SARAH E. GOODE STEM ACADEMY: Chicago, Illinois
Launched in September 2012, Sarah E. Goode STEM Academy is a partnership among the Chicago Public Schools, Richard J. Daley College of the City Colleges of Chicago and IBM.

Leadership and Staff
- School Leadership: Principal Armando Rodriguez and Assistant Principal Rufino Bustos
- 56 teachers, one STEM Program Manager, one Early College & Career Coordinator, three Counselors, one full-time IBM liaison and one full-time Richard J. Daley College liaison

Student Profile
- 832 total student population
- Approximately 50% male, 50% female
- 97% Black or Hispanic
- More than 88% of students qualify for free or reduced lunch
- 18% of students have an Individualized Education Plan (IEP)
- 95% average attendance for 2015 – 16

Academic Achievements
- By July 2017, 13 students will have graduated early, earning both their high school diplomas and their associate degrees in computer science, web development or networking technology. A majority plan to pursue their bachelor's degrees.
- 93% Freshman On-Track rate 2015-2016 (compared to 64% District-wide). "On-track" rate based on attendance and GPA; freshmen classified as "on-track" are 4 times as likely to graduate from high school and have a higher likelihood of persisting in college
- 170 students enrolled in college classes Spring 2017
- Goode students pass college courses at a rate of 90% (as compared to a national community college average pass rate of 20%)

NORWALK EARLY COLLEGE ACADEMY (NECA): Norwalk, Connecticut
Opened in August 2014, Norwalk Early College Academy (NECA) was developed in collaboration among the Norwalk Public Schools, Norwalk Community College and IBM. NECA is Connecticut's first P-TECH 9-14 school. Graduates will earn an Associate in Applied Science degree in either Software Engineering or Mobile Programming. Connecticut opened three additional P-TECH 9-14 schools – known as Connecticut Early Opportunity (CT-ECO) schools – in fall 2015. Connecticut opened a fifth P-TECH school in fall 2016.

Leadership and Staff
- Founding School Director, Karen Amaker
- 6 teachers, 1 full-time IBM liaison, 1 part-time school to career coordinator

Student Profile
- 208 students (66 ninth graders; 74 tenth graders; 68 eleventh graders)
- 59% male; 41% female

- 45% Hispanic; 33% Black; 16% White; 6% Asian

Academic Achievements
- 40% of students placed into college-level English and mathematics by the end of Year 1
- 50% of students achieved high honor roll (GPA of 3.4 or higher) in the 2015-2016 academic year
- 53% of students achieved honor roll (GPA of 3.0 or higher) in fall 2016 quarter 1
- 37 percent of rising 10th graders and rising 11th graders enrolled in a 10 week college session in summer 2016, with over 90% of students passing
- 38% of all NECA students are enrolled in college courses in fall 2016

EXCELSIOR ACADEMY: Newburgh, New York

Excelsior Academy is a partnership among the Newburgh Enlarged City School District, the State University of New York at Orange (SUNY Orange) and IBM. The first program of its kind in the region, Excelsior Academy provides students with the opportunity to earn an Associate in Applied Science (A.A.S.) degree in either Computer Networking (C.I.T.) or Cyber Security in addition to their high school diploma. Housed within Newburgh Free Academy, North Campus, Excelsior Academy is one of 16 P-TECH high schools that opened in fall 2014 as a part of Governor Andrew Cuomo's New York State P-TECH grant. Excelsior Academy students benefit from a small-school environment where teachers and staff plan each student's program collaboratively.

Leadership and Staff
- Founding Leadership: Excelsior House Principal Kevin Rothman and Newburgh Free Academy Principal Matteo Doddo
- 7 dedicated teachers, 3 SUNY Orange adjunct professors, 1 guidance counselor, 1 full-time IBM liaison, 1 full-time SUNY Orange college liaison

Student Profile
- 148 students (50 ninth graders; 49 10th graders, 49 11th graders)
- 54% male; 46% female
- 54% Hispanic, 32% Black, 13% White, 1% Asian
- 74% of students qualify for free or reduced lunch
- 9% of students have Individualized Education Programs (IEPs)

Academic Achievements
- 98% student retention rate half-way through 3rd full year of operation
- 95% attendance rate, compared to 90% for the district
- 52% of current Year 3 students will have access to higher-level math (calculus) before they finish the program, compared to only 26% that were on track entering 9th grade
- College Coursework: College coursework begins in Year 2. Of the 99 Year 2 and Year 3 students,
  - 73% (73/99) are currently enrolled in college coursework
  - 70% have met the college-ready benchmarks for math before their 3rd year in high school
  - 37 students have earned at least 4 college credits
  - 15 students have earned at least 19 college credits
  - 40% of students have met the college-ready benchmarks for English during their first year of access

FALCON TECH, A ST. VRAIN P-TECH SCHOOL: Longmont, Colorado
Falcon Tech, a partnership between IBM, St. Vrain Valley School District, and Front Range Community College, is a school within a school, located within Skyline High School. At Falcon Tech, students earn an Associate in Applied Science Degree in: Computer Information Systems, Database Administration, Web Development, or Programming.

Leadership and Staff
- Founding Leadership: Greg Stephens, Principal, Falcon Tech; Heidi Ringer, Principal, Skyline High School; Brandon Shaffer, Executive Director of Legal and Governmental Affairs, Community Outreach, and P-TECH
- 4 dedicated P-TECH teachers in the areas of Computer Science, English, History, and Science, and 1 counselor
- Full-time liaisons from Front Range Community College and IBM

Student Profile
- 51 total student population
- 65% boys; 35% girls
- 70% Hispanic and 30% Caucasian
- 65% Free and Reduced Lunch
- 76% First Generation College

P-TECH AT CARVER: Baltimore, Maryland
P-TECH at Carver is a partnership among Baltimore City Public Schools, Baltimore City Community College, and IBM. At P-TECH at Carver, students earn an Associate in Applied Science degree in either Computer Information Science or Cyber Security, in addition to their high school diploma. Housed within the historic Carver Vocational Technical High School, P-TECH at Carver opened fall 2016 with a cohort of 50 students.

Leadership and Staff
- Founding Leadership: Eugene Chong Qui, Principal, P-TECH at Carver; Shionta Sommerville, Principal, Carver Vocational Technical High School
- Full-time liaisons from Baltimore City Community College and IBM

Student Profile
- 50 total student population
- 25% boys; 25% girls
- 100% Black or Hispanic
- 2% of students have Individualized Education Programs (IEPs)
- Approximately 82% receive free or reduced lunch