Inspiring High-Achieving Chicago-Area Teens to Lead and Serve through STEM

The Illinois Institute of Technology (IIT) Boeing Scholars Academy is a free, year-round academic enrichment program that inspires high-achieving Chicago-area high school students to make a difference in their communities through STEM (science, technology, engineering, mathematics) and to pursue higher education. We do this by offering:

- four weeks of intensive, project-based STEM programming each summer—in 2012, themed “Local Action, Broader Impact”
- workshops, seminars, and field trips during the school year
- college advising and career exploration opportunities
- guidance and support developing leadership projects

Our approach to STEM education involves fostering a community-centered environment that values student voice, collaboration, and innovation. We design our curriculum and programming to be “learner-centered,” actively using brainstorming sessions and program admissions essays to inspire relevant and exciting STEM projects and interdisciplinary summer themes. By beginning with the “so what?” (real-world problems and their significance to teens) rather than the “what” (STEM content and skills), we engage Scholars’ existing knowledge, inquiry, and motivation, as well as help them find their way forward (“now what?”) and develop a sense of purpose.

Founded in 2011, this program is generously supported by a grant from the Boeing Company.

Valuing, Engaging, and Learning from Diverse Young Leaders

The 2012-13 cohort includes 106 exceptional students (61 seniors and 45 juniors) hailing from 52 high schools. Their average GPA is 4.3 (weighted) or 3.7 (unweighted) and their average ACT score is 27 (seniors only), and they were selected for participation out of more than 400 applicants for their promise as future leaders, curiosity about STEM fields, and vision for positively impacting their communities and the world. Of this year’s Scholars:

- 84% attend a Chicago Public School or affiliated charter
- 68% are from a population underrepresented in STEM fields
- 55% are female
- 45% are first-generation college
- 44% are eligible for federal free/reduced lunch

Of last year’s seniors, 97.7% matriculated at a four-year university in fall 2012; the remaining 2.3% enrolled at two-year institutions with intent to transfer to a four-year institution.

Contact

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Summer 2012: Solving Complex, Real-World Problems with “Local Action, Broader Impact”

The 2012 Summer Session—themed “Local Action, Broader Impact”—ran June 25 - July 20, 10am-5pm each weekday. With the guidance of faculty, university students, and professionals, Scholars investigated interconnected world problems, learned about the many scales on which they can be addressed (not only local and global, but infrastructural, populations-level, cellular, nano!), and proposed local actions that could effect broader change. Among the topics explored through lectures and hands-on challenges were food access, infectious disease, sustainable land use, the role of science in policy-making, and design’s capacity to alleviate and even solve social ills.

Additionally, each Scholar immersed themselves in a seven-day “Serving through STEM (SIS)” Project, which provided them with further exposure to STEM majors and professions and experience contributing to a project in the real world. For each of these “programs within a program,” Scholars developed deliverables and presented them to stakeholders.

- For **Analyzing Data in the Public Interest: Computing Approaches to Investigating Community Health Indicators in the United States**, Scholars applied basic computational methods for data collection and analysis to research local and national health and wellness indicators, then created a website to share their findings.
- Through **Engineering Research and Mentorship: An Introduction to Understanding Diabetes, Its Complications, and Treatments**, Scholars learned from faculty and undergraduate researchers about the many ways engineers contribute to new treatments of diabetes and its complications—then shared what they learned with middle schoolers.
- With **Enhancing Design Engineering Education: Iterating “DESIGN. BUILD. TEST.” with the James Dyson Foundation**, Scholars acted as analysts and consultants to influence the re-design of the DBT after school program.
- In **Nature Education in the City: Developing a Community-Based Youth Volunteer Program for the Chicago Zoological Society and Eden Place Nature Center**, Scholars investigated the applicability of zoo science, ecology, and other natural sciences to the lives of urban residents and proposed ways to inspire conservation locally.
- As part of **Urban Recycling in Chicago and Beyond: Promises and Problems**, Scholars conducted cost-benefit analyses of different types of recycling (e.g., electronic, food waste) and presented their findings to a city official.
- Through **Urban Solar: Developing Chicago’s Capacity for Solar Energy**, Scholars used Google Earth to develop proposals for the optimal placement of solar panels in the city and presented them to the Mayor’s and Governor’s offices.

In addition to learning how to frame and solve problems, Scholars continued their development as globally competent young leaders—capable of investigating the world, recognizing perspectives, communicating ideas, and taking action!

**Collaborating to Impact and Create Opportunities in Our Communities**

During the summer, Scholars collaborated in teams to propose Leadership Grant Projects (LGPs) of their own design to be implemented over the course of the next year. A capstone of sorts, LGPs require Scholars to take a proactive, structured approach to identifying and addressing real problems in the real world. Guided by Project Mentors (adult professionals), Scholars are empowered to promote positive change and create opportunities in their communities.