

The Office of STEM Education Partnerships (OSEP)

*Connecting K-12 teachers and students to the world-class
science, technology, engineering, and math resources of
Northwestern University and beyond*



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What does OSEP do?

- Translate authentic STEM research and practices from industry and academia to K-12 to enhance STEM teaching and learning in K-12
- Focal Areas
 1. Teacher Professional Development
 2. New STEM Curricula, Programs, and Technology (formal and informal)
 3. Capacity Building
- Work in partnership with faculty, industry, schools, and community organizations





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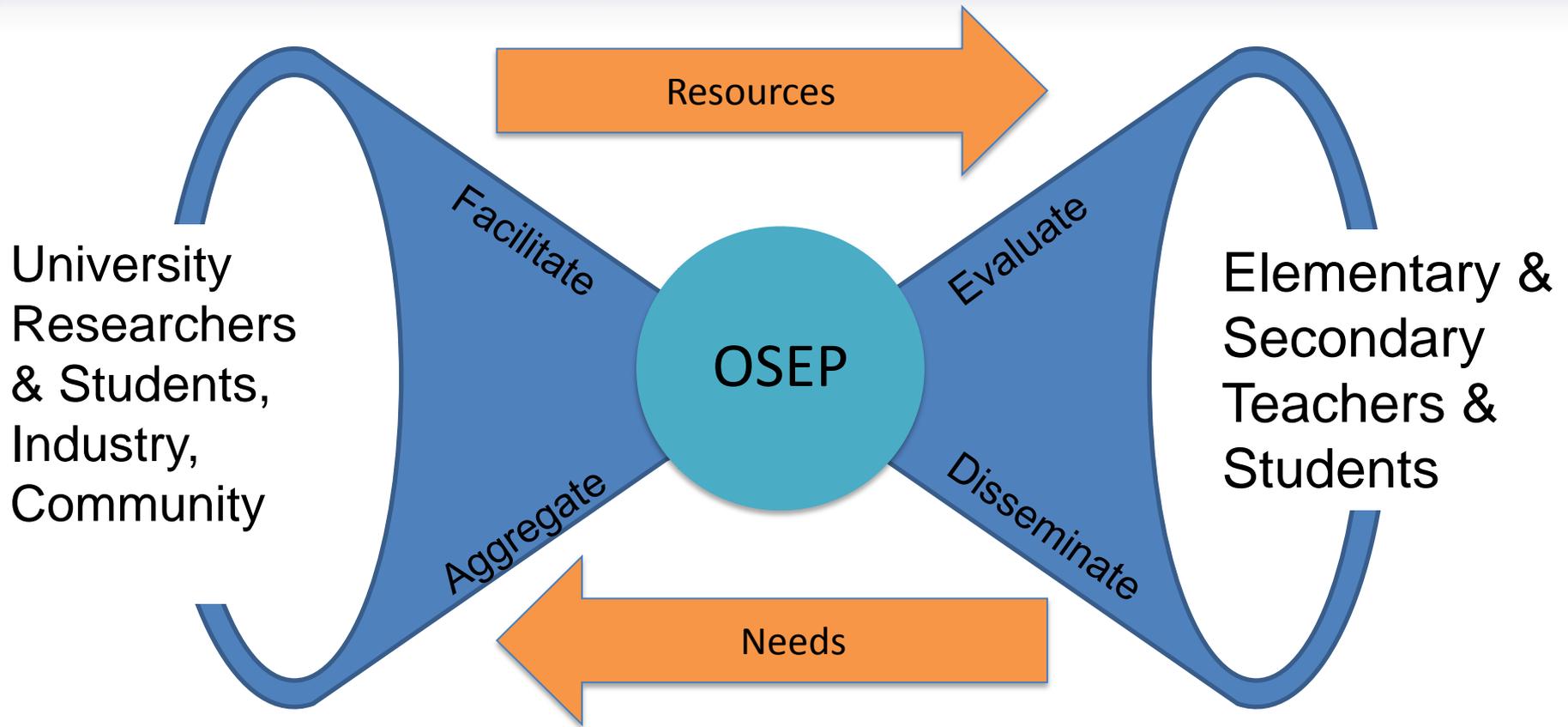
Why OSEP?

- Research – education and broader impacts
- Thought leadership and expertise in STEM Education
- Support NU's Strategic Plan
- President Schapiro's *Good Neighbor, Great University* Initiative
- Sustainability and Scalability



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Catalyzing Partnerships & Amplifying Impact





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11 STEM Programs

1. **iLabs**—access to real laboratory equipment via the web
2. **Watershed Dynamics**—using the web-based FieldScope GIS to study water availability and human impacts on the watershed
3. **EcoCasting**—hands-on inquiry and computational modeling of ecosystems, food webs, and bioaccumulation
4. **CT-STEM—Embedded Computational Thinking**—incorporating computational thinking and modeling tools into traditional high school STEM courses
5. **STEM Student Research & Design Program**—capacity building program for teachers focused on developing high school student R&D programs
6. **Climate Change and Sustainability**—professional development, classroom modules, symposia, and research experiences for teachers



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11 STEM Programs

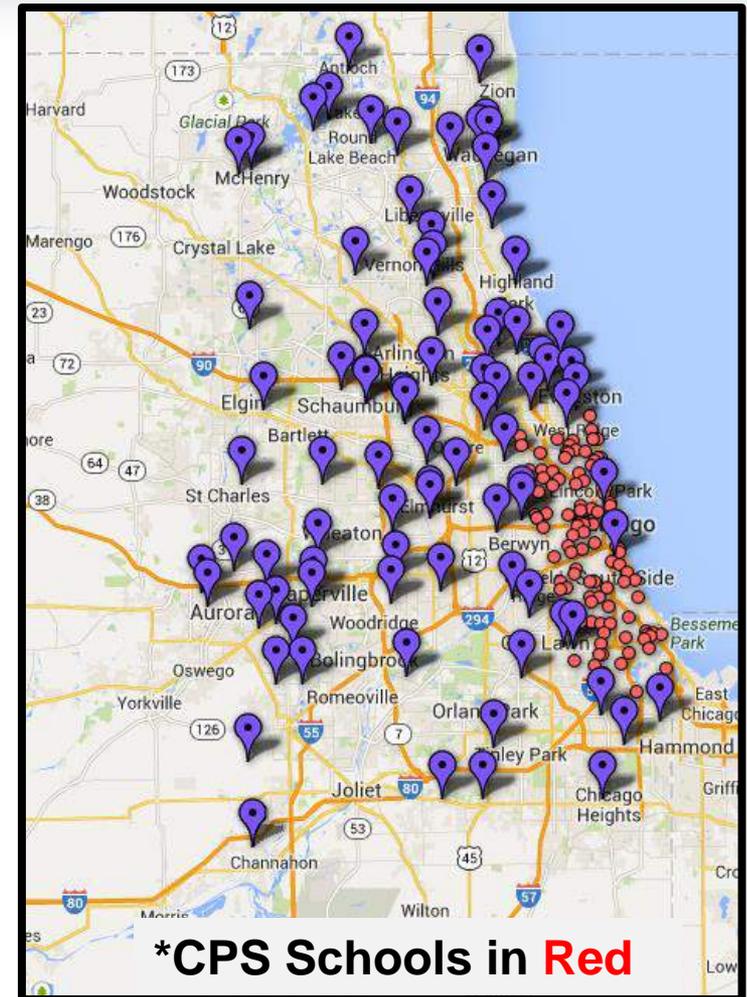
7. **Reach for the Stars**—NSF program that places STEM graduate students in K-12 science classrooms to bring cutting-edge science and research to teachers and students
8. **iSTAR@NU**--Institute for STEM Teaching and Research at Northwestern University, professional development program for teachers
9. **Biotech Center of Excellence**—high school science labs based on biotech research
10. **FUSE**—informal STEAM (STEM + arts) program involving hands-on exploratory challenges
11. **STEAM**— integrating the arts and design into STEM



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A Growing School Network

- 200+ Area Schools
- 600+ Teachers
- ~48,000 Students





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Partnerships

Corporate

- Baxter International
- The Boeing Company
- Google
- Hewlett Packard
- Motorola Mobility
- Motorola Solutions
- Siemens Industry Inc.
- IRMCO—Evanston-based



Expanding Minds with Real-World Science



Baxter



**MOTOROLA SOLUTIONS
FOUNDATION**



Foundation

- MacArthur Foundation





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Partnerships

Government

Illinois Pathways Initiative

- Research and Development STEM Learning Exchange



Community

- Hive Chicago Learning Network
- Chicago Architecture Foundation
- Chicago Public Library
- Evanston Public Library
- North Chicago Public Library



Teacher Professional Development



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iSTAR@NU

iSTAR@NU: Institute for STEM Teaching and Research at Northwestern University

- Program Elements
 - 19 PD offerings in 2014 - 2015
 - New Curriculum and Technology
 - Research Experiences for Teachers
 - Job Shadowing Experiences for Teachers
 - Follow up In-class Coaching
 - Equipment loan program

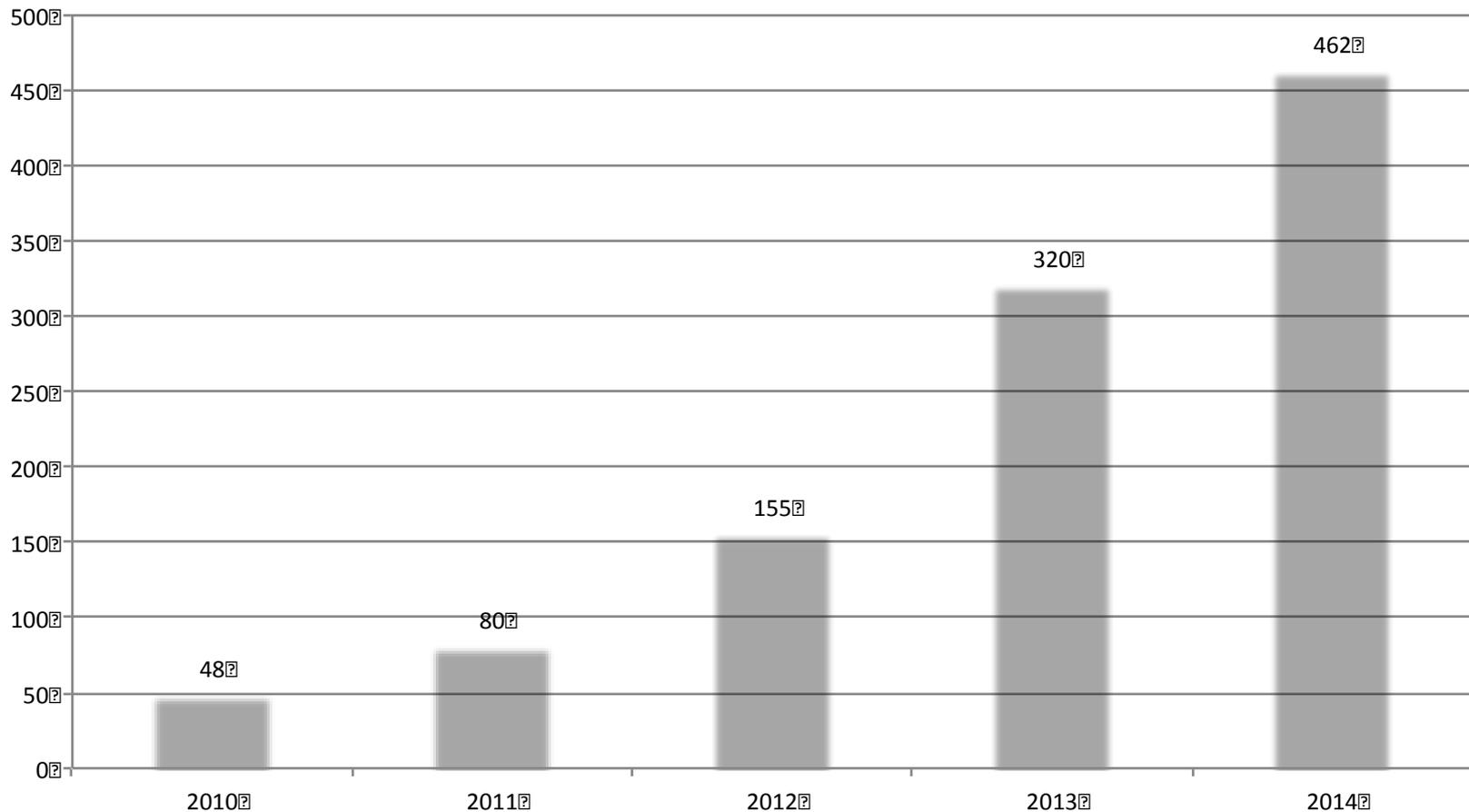




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Growing Impact on K-12 Teachers

Number of STAR@NU Participants



New STEM Curricula and Programming



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Biotechnology Center of Excellence (BCoE)

*Lindblom Math and Science Academy,
Baxter International, and OSEP*



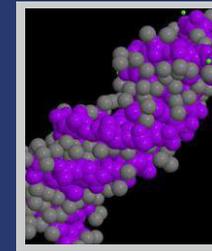
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Advancing Biotech Education: from the bench to the classroom

Biotechnology Professional Development Series



Advancing Biotechnology Education in Chicago



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Office of STEM Education Partnerships



LINDBLOM MATH & SCIENCE ACADEMY
BIOTECHNOLOGY CENTER OF EXCELLENCE



Expanding Minds with Real-World Science

Baxter



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BCoE Offerings

www.bcoe.net

- Multiple PD Opportunities for Teachers
 - Workshops
 - Symposia
 - Webinars
- Baxter Boxes and Loaner Kits
- Growth of Biotech Courses across CPS
- 2014: 116 Teachers from 87 Schools





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Teacher Reactions



FUSE



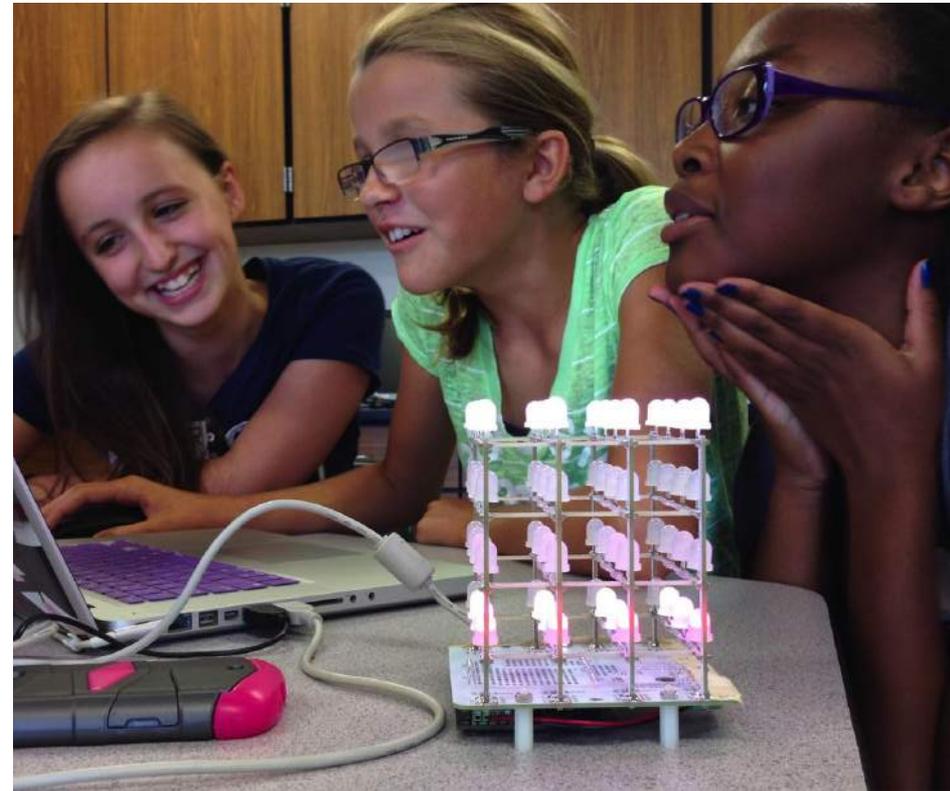
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FUSE

- Fun, low-barrier entry to STEM
- Challenges support wide range of skills
- Youth-driven format sparks interest development
- Promotes development of persistence, creative problem-solving
- An on-ramp to deeper STEM engagement
- Adults as facilitators, coaches



<http://fusestudio.net>



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FUSE

FUSE

CHALLENGES

DASHBOARD

MY STUFF

SIGN OUT



CHALLENGES



Crystal Ball

Fade and Flash combinations of Red, Green, and Blue LED lights - program them to create a fantastic light display!



Design Your Line

Design your own unique clothing line and pitch it to a real fashion designer!

CHICAGO ARCHITECTURE FOUNDATION



Dream Home

Design your dream home in 3D.



Electric Apparel

Customize your clothing and accessories so that they light up when you use them.



Eye Candy

Design your own glasses and print them out!



Jewelry Designer

Design your own jewelry and print it out in 3D! Create unique earrings, bracelets, and more!



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FUSE

Academic & Industry Partners



CHRISTOPHER
DUQUET



Motorola Mobility
Foundation

SIEMENS

CHICAGO
ARCHITECTURE
FOUNDATION



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FUSE

Designed to Scale

- Schools & school districts; public libraries; YMCA, & other orgs
- 32 current Studios
- > 4,000 youth to date
- Studios opening in CA, OH in Fall 2015
- AY15-16: ~6,000 youth in 60 Studios





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FUSE

Schaumburg D54 Partnership

☰ SECTIONS 🔍 SEARCH

Chicago Tribune

THURSDAY AUG. 6, 2015

BREAKING SPORTS SUBURBS BUSINESS POLITICS OPINION SANDRA BLAN

Rep. Duckworth helps launch FUSE in District 54



CHICAGO TRIBUNE



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FUSE

**Schaumburg D54
Partnership**

Why FUSE?

- District sought STEM program for all students
- Accessible, interest-driven FUSE challenges appeal to wide range of youth
- Emphasis on interest-development, 21st-century skills crucial for middle school years
- Flexible implementation styles meet diverse school needs
- Facilitator training provided; no prior STEM content expertise required



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FUSE

Schaumburg D54 Partnership

- 27 schools
- >2,000 students
- In- and after-school implementation
- Full-time Partnership Coordinator
- Research partner





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FUSE

Successes in
Schaumburg

- Engagement at FUSE sparks participation in other STEM offerings
- FUSE is most popular “Summer STEM” elective
- For district leadership, FUSE offers a model for shifting teacher practices

“A blockbuster hit across the district.”

- Associate Superintendent



MICHELLE BURKE

FUSE Facilitator · Jane Addams Junior High · Schaumburg, IL

Capacity Building



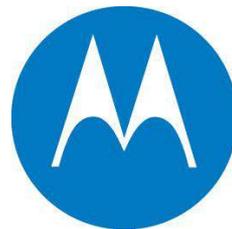
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STEM Student Research & Design Program

- Building Capacity for Student R&D Programming
- Teacher Professional Development Courses and Workshop
 - Student Research Facilitation Online Course
 - STEAM PDs



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STEM Student Research & Design Program



- Conferences
 - STEM Summit
 - STEAM Summit
- Online Resources
 - Mentor Matching Engine (MME)
 - STEM Communication Modules
- Student Programs
 - Project Showcase



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Contact Information

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OSEP Homepage

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