

STEM EDUCATION PARTNERSHIP Framework



An increasing number of reports point to significant gaps in our STEM – science, technology, engineering and mathematics – workforce and leaks in our STEM education pipeline. The reports recognize that, as state and federal funding, and other public education resources continue to decline, one solution is to call upon our **STEM professionals to partner with students, teachers and school systems.***

Strategies for establishing successful STEM education partnerships, however, are not clearly defined in these reports.

The purpose of this document is to provide a high-level framework of strategies for STEM professional organizations to engage in STEM Education Partnerships. **STEM professional organizations are defined as those that employ and contribute to the STEM workforce** – business, labor and industry, professional societies, non-profit research institutes, and institutes of higher education. STEM professional organizations may range in size from corporations with foundations, to small, community-based businesses. Likewise, a **STEM Education Partnership can range in scope** from engagement at the student or classroom level to working with school and district leadership on a system-wide project.

BENEFITS

The benefits of engaging in STEM Education Partnerships vary. For the **STEM professional organization**, participation in STEM Education Partnerships can:

- Boost employee goodwill and morale
- Contribute to community vitality and economic development
- Advance student learning (STEM knowledge, skills, attitudes and beliefs) by enhancing educational experiences
- Create exposure and recognition of STEM professional organizations

School systems benefit from STEM Education Partnerships by way of introduction to STEM skills and knowledge, examples of real world application, and importantly, the excitement and motivation of STEM. The leadership of school systems recognizes the benefit of such partnership – a study by DeHavilland Associates surveyed more than 750 superintendents and other local education officials and found that these educational leaders ranked **individual businesses as the most important community partnership** ahead of well-established partners such as parent organizations and booster clubs.

FOUNDATIONS OF A PARTNERSHIP



All STEM professional organizations have the potential to engage in STEM Education Partnerships, but the form that such a partnership takes will be based on the context, assets and interests of the organization. No matter the STEM Education Partnership, **STEM professionals must always engage with students and educators as colleagues.** A colleague is respectful to all involved in the partnership and is engaged both as a learner as well as a contributor. This is particularly important when at the stage of establishing the foundation of a STEM Education Partnership.

Guiding Principles:

- Recognize that partnerships are a process
- Determine context and needs of all partners – assure the partnership is win-win in nature
- Identify assets and available resources
- Set realistic goals
- Clearly define expectations, roles and responsibilities
- Emphasize clear communications
- Determine a strategy to elicit feedback and evaluate return on investment

*Examples reports include the PCAST *Prepare and Inspire: K-12 Science, Technology, Engineering and Math (STEM) Education for America's Future*, and Washington State's STEM Advisory Group's *Recommendations for Science, Technology, Engineering and Mathematics*.



ROLES

The following framework comprises three roles that STEM professional organizations may consider when developing a STEM Education Partnership: STEM Expert, Resource, and Advocate.



STEM Expert

First-hand STEM experience enhances student and teacher learning of **STEM knowledge, skills, attitudes and beliefs**. STEM expertise is vast across disciplines and organizations, so the opportunities can be infinite.

Example Activities:

- Student internships (exploration of career opportunities)
- Teacher externships (experience real-world application of STEM content)
- Mentorships, catalyzing ideas of opportunity for students and providing guidance for courses and careers
- Contribute expertise to professional development for teachers and administrators
- School-based engagement in classroom discussions or demonstrations and/or judge science fairs
- Review materials (e.g., curriculum and standards)
- Contribute to the design of curriculum, projects and certificate/degree programs

Partnership Profiles: The Washington Aerospace Training and Research Center trains high school graduate to fill high-demand aerospace jobs and the Microsoft TEALS program brings computer scientists into classrooms.



Resource

Many education systems solicit cash donations from prospective STEM partners. But **resources beyond a check** can be helpful, too.

Example Activities:

- Financial resources may include unrestricted funds, grants, employee collections or sponsorships
- Financial support may also come by way of collaborative grant writing, particularly to STEM-based organizations that school systems typically cannot access (e.g., National Science Foundation, National Institutes for Health, Department of Defense)
- Materials and equipment donations, such as surplus or retired materials, as well as assistance in purchase for new materials.

Partnership Profile: Despite being a non-profit organization, the Institute for Systems Biology actively supports districts in accessing STEM funding by way of grant writing partnerships, such as an award from the Howard Hughes Medical Institute that has partnered Renton School District's elementary teachers with Institute scientists.



Advocate

Advocates develop a clear and consistent message that **STEM is imperative to the lives and welfare of today's students and their future**. The messaging must rally community support and build excitement about engaging in STEM.

Example Activities:

- Visible institutional commitment to supporting STEM education
- Editorials (in partnership with educators) in the media
- Testimonials and letters to PTA, school board, or state government
- Visibility and communication at community events to share the excitement of STEM
- Establish or contribute to a STEM education public relations campaign

Partnership Profile: *We are STEM* is a growing network of STEM professionals of color from Washington State interested in serving as role models, mentors and advocates. Network members advocate in support of Common Core Standards in math and the Next Generation Science Standards by way of published op-eds as well as strategic testimonials.

RESOURCES

- *Building a Diverse United States STEM Workforce: Perspectives on Creating Successful Business Education Partnerships*. 2010 Edition. Bayer Corporation.
- *Scientists in Science Education*. January 2008. BSCS.
- *The STEM Accelerator Initiative (SAI) Guide to Building Effective STEM Programs*. 2007. Written by B. Pawlowski of DeHavilland Associates with support from Lockheed Martin.
- *Creating Effective Business-Education Partnerships*. June 2011. The Council of State Governments.
- *Guiding Principles for Business and School Partnerships*. The Council for Corporate and School Partnerships founded by Coca-Cola.