

STEM READY AMERICA

Inspiring and Preparing
Students for Success
With Afterschool and
Summer Learning

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Tomorrow's coders, construction managers, nurses and engineers are in America's classrooms, eager to take part in the kinds of learning activities that encourage critical thinking, creativity, problem-solving and teamwork. Young people gain these abilities when they are immersed in science, technology, engineering and mathematics (STEM). Afterschool and summer learning programs are playing a significant role in ensuring our children and our nation are "STEM ready" for the future. *STEM Ready America* is a testament to the impact of afterschool and summer programs on learning and engagement and to the systems-building efforts and partnerships that are strengthening STEM education in communities across the country.

This compendium provides insights, experiences, research, and recommendations on STEM learning afterschool and its connection to schools and communities. Although this limited collection of articles cannot represent all the innovative and important work taking place across the country, it can, we believe, provide a meaningful account of the scope and value of STEM afterschool. This introduction briefly describes the organization of the articles and provides an orientation for readers to enable them to find the articles that are of greatest interest.

Part One: The Evidence for STEM Learning in Afterschool

The four articles in Part One of this compendium clearly establish the solid research base for documenting the accomplishments of STEM in afterschool and summer programs. Although they do not list every article in this field, they collectively provide an excellent introduction to the nature of the research, the kinds of outcomes that we have come to expect from afterschool and summer programs, and the policy implications of the major findings.

Best Practices in Out-of-School STEM Learning, summarizes a report from the National Research Council that investigates the findings from hundreds of research studies concerning the value of STEM in afterschool and summer programs.

From Evidence to Policy: The Case for STEM Afterschool reviews the consensus understandings from and discusses the policy implications that flow from the research.

NGSS as a Bridge Between School and Community Educators makes a case for using the Next Generation Science Standards as a common language for formal and informal teachers of STEM subjects to share ideas and develop joint strategies and projects.

The Learning SySTEM (forthcoming) reports on youth achievement in STEM based on national and international assessments, and reflects on the many ways that people learn STEM outside of the school day.

Afterschool and STEM-Building Evaluation, 2016 (forthcoming) is a study across eleven states that have received support from the Mott Foundation and STEM Next. The study involves both the use of observation instruments to document the nature and quality of STEM programming and student outcomes. The findings show strong correlations between youth achievement and program quality and duration.

Part Two: Strengthening Partnerships

Part Two highlights state and citywide efforts to forge networked partnerships that strengthen in-school and community-based STEM learning, create STEM career pathways to improve workforce outcomes, and facilitate strategies for building cross sector STEM learning ecosystems that coordinate programs, resources, and funding. The articles highlight the growing STEM ecosystems movement and describe partnership and systems-building efforts in Oregon, Indiana, Nebraska, and New York.

The Story Behind STEM Learning Ecosystems articulates the vision and strategies that inform STEM systems-building work focused on the entire learning continuum and the intersections of each dimension of the learning community, from early education and afterschool programs to philanthropy and business. The article discusses the goals and design principles of the STEM Ecosystem work, as well as the elements that are central to the success of that work.

Building Oregon STEM Systems for Learning is one of the most comprehensive STEM learning plans in the country, led by the governor, state superintendent, Oregon ASK (afterschool network), the business council and funders. The plan emphasizes the effective use of regional STEM Hubs, funded by the Oregon state legislature, to accommodate local variations in community needs due to differences in geography and access to resources.

Preparing the Indiana Workforce Through Partnerships describes the challenges that Indiana faces in preparing its youth to meet the workforce needs of business and industry. The article describes the ways that the Indiana Afterschool Network has been building a broad coalition to meet the challenge.

The Nebraska Way: Building STEM Learning Systems from the Bottom Up provides a brief history of the work of Beyond School Bells, the Nebraska afterschool network, to identify resources and partnership opportunities to build STEM learning systems from the bottom up and strengthen school-based, community-powered afterschool and summer programs.

Making Way for STEM Afterschool in New York State (forthcoming) is an interview with MaryEllen Elia, Commissioner of Education for the state of New York. The interview address a range of topics, from funding for afterschool and summer programs to the Commissioner's efforts to implement a more a balanced curriculum that integrates STEM, to the importance of scaling successful models for STEM learning in and out of school.

Scientific Partnerships at the Core describes an effort in New York City dedicated to promoting strong STEM learning in afterschool by cultivating collaborations among formal and informal STEM educators and emphasizing STEM-specific professional development.

Afterschool and summer learning programs are playing a significant role in ensuring our children and our nation are “STEM ready” for the future.

Part Three: Ensuring Equity and Access to Quality STEM

There is a wide and persistent disparity in STEM participation and success rates among youth from communities of poverty and more affluent communities, as well as between white and Asian students and students of color. Additionally, although assessments show that girls and boys have equivalent aptitude for STEM learning, differences persist in the relative number of boys and girls who choose higher-level courses, college in STEM fields, and the professions. However, afterschool and summer programs have the potential to level the playing field by preventing summer learning loss and supporting all students' interests and engagement in STEM.

Part Three of this compendium highlights organizations and partnerships that have developed innovative, scalable approaches to expanding access to high-quality afterschool and summer STEM learning.

Imagine Science: A Coalition of National Youth Organizations Bringing STEM to Scale tells the story of Imagine Science, a collaboration among the national leaders of 4-H, YMCA, Boys and Girls Clubs and Girls Inc., to share resources and materials for improving the quality and increasing the number of STEM afterschool and summer programs.

Engaging Girls in STEM: At the Crossroads provides a compelling narrative, supported by many successful examples, of strategies to encourage greater participation of girls in STEM programs.

Career Pathways: Preparing Youth for STEM Careers takes a look at how intentional STEM college and career pathways can help expand opportunities for youth by facilitating authentic learning experiences that inspire interest in STEM and strengthen STEM identities.

Engaging Creative Minds: How Summer STEAM Deepens Engagement, Heightens Interest, and Expands Opportunity examines summer programs that incorporate the arts along with the STEM fields to stimulate creativity, connect to the youth's culture and better educate the whole child.

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