

By the Numbers

- STEM workers in all demographic groups, including those who are foreign-born, **earn more** than non-STEM workers.
- Seven out of ten STEM workers are **Non-Hispanic White Americans**.
- One in five STEM workers is **foreign-born**, of which 63% come from Asia.
- **Non-Hispanic Black Americans and Hispanics** each account for 6% of all STEM workers, but 11% and 14%, respectively, of overall employment.
- For 65% of scientists with advanced degrees, their interest in science started **before middle school**.
- While earning a STEM degree is one important milestone in pursuing a STEM career, just 2.2% of Hispanics and Latinos, 2.7% of African Americans, and 3.3% of Native Americans and Alaska Natives earned a **first university degree** in the natural sciences or engineering by age 24.
- While women constitute the majority of students on college campuses and roughly 46% of the workforce, they represent **less than one in five** bachelor's recipients in fields like computer science and engineering.
- Women hold only **23% of STEM jobs**.
- In 2009, only 34% of American fourth grade students and 21% of twelfth grade students performed **at or above the proficient level in science**.



A teen learns digital media technologies through the Las Vegas-Clark County Library District's *TechArt Studio* Program.

How Library Programs Benefit STEM Learners

- Libraries offer people of all ages and backgrounds mentor-led learning opportunities that spark curiosity and build interest in STEM subjects.
- Librarians provide adults, families, teens, and children with new technology and equipment, including state-of-the-art digital media production tools.
- Libraries introduce learners who are underrepresented in the STEM workforce to important STEM concepts and skills, including authentic scientific practices.
- Libraries have learning spaces that feature youth-centered approaches to enhancing technical knowledge, strengthening independent learning skills, and building a foundation for the pursuit of higher education STEM opportunities and jobs.
- Visiting libraries positively impacts academic achievement in science. (Swan)

Recent Grants from IMLS Help

- Librarians are learning strategies to incorporate principles of STEM education and inquiry-based practices in the design and implementation of programs for youth that supplement school-based learning and promote pursuit of careers in STEM. (Allegheny County Library Association)
- Researchers are studying how librarians can help youth become successful information creators through project-based, guided-inquiry STEM learning experiences. (University of Oklahoma)
- Library patrons are benefiting from expanded services for learning and access to information and educational resources in a variety of formats, including hands-on educational resources for children to explore STEM careers and engineering and science exhibits. (Central Texas Library System, Inc.)
- Libraries are helping children learn about digital photography, 3D movies and television, podcasting, internet safety, geocaching, solar power, robots, and how to create websites. (Richton Park Public Library District)

Examples of Model Projects

Carnegie Library of Pittsburgh - Pittsburgh, PA

The Labs @ Carnegie Library of Pittsburgh (CLP) is a teen-driven, interest-based digital learning environment designed to serve teens in and around the city of Pittsburgh. The Labs @ CLP has expanded the library's teen services programming by providing teens with opportunities to create and share digital media using free library resources in four strategically placed learning labs throughout the city. Programs are mentor-led, project-based, and guided and informed by youth. With the help of key community partners—including Carnegie Museums of Pittsburgh, Carnegie Mellon University's Entertainment Technology Center, University of Pittsburgh School of Library and Information Science, Filmmakers at the Center (Pittsburgh Filmmakers), Hip-Hop on LOCK, Saturday Light Brigade (Radio),

Carnegie Mellon University Robotics Institute, and HackPittsburg.org—the project has reached teens in underserved parts of the city.

Howard County Library - Columbia, MD

The Howard County Library System (HCLS), in partnership with the University of Maryland Baltimore County, has enhanced the teen digital media lab at the Savage Branch Library by adding science, technology, engineering, and math projects and implementing that same STEM-focused model in three other libraries. The "Hi Tech Academy: The Road to a STEM Career" project has addressed the increasing demand for workers with STEM-related skills as the number of college graduates in these fields decreases. This program has created a replicable programmatic model that has brought awareness of how to best teach these skills, increase interest in STEM for youth, and address the demand for these skills in the community.

References

Maltese, A.V., & Tai, R.H. (2010). Eyeballs in the fridge: Sources of early interest in science. *International Journal of Science Education*, 32(5), 669–685.

For more information, see: www.whitehouse.gov/administration/eop/ostp/nstc/committees/costem and <https://nms.org/Portals/0/Docs/STEM%20Crisis%20Page%20Stats%20and%20References.pdf>.

About the Institute of Museum and Library Services

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