A black background with a black square

Description automatically generated with medium confidenceSTEAM Careers: Myth Busting

**Discussion Guide**



**What to do:** Try these discussion starters if you have students who think careers in science, technology, engineering, the arts, and mathematics (STEAM) are beyond their reach or not relevant to their lives or career paths.

**Why it matters:** Young people who think they aren’t “smart enough” or who think STEAM subjects don’t connect to their future lives may not have had enough support to explore them. You can help to spark their interest and fire up their curiosity.

## Discussion starter: If you’re not interested in STEAM subjects in school, do you think that means STEAM careers aren’t right for you?

**Share this insight:** When I hear someone say, “I’m just not interested in math or science or the arts,” I always think, “Ah, so you’re not interested *yet*.” Curiosity isn’t a fixed quality. It changes with new experiences. In a video interview for Doing What Works (U.S. Department of Education, 2007), Dr. Jon Star of Harvard University says developing interest in something is “a process.” He says it can be sparked by instructional activities and nurtured by adult support. Having new and different experiences can help you see connections between what you’re learning in school and what happens in the real world. Never say never!

## Discussion starter: Do you think school is the best or only place to learn about STEAM subjects?

**Share this insight:** An article in *American Scientist* says school isn’t where most Americans learn most of their science. Authors John Falk and Lynn Dierking (2010) explain, “The ‘school-first’ paradigm is so pervasive that few scientists, educators, or policy makers question it. This despite two important facts: Average Americans spend less than 5 percent of their life in classrooms, and an ever-growing body of evidence demonstrates that most science is learned outside of school.” There’s no predicting where curiosity, once ignited, might lead. Some 75 percent of Nobel Prize winners in the sciences say their passion for science was sparked outside of school (Friedman & Quinn, 2006).

## Discussion starter: Do you think boys are more interested than girls in science, technology, engineering, and math?

**Share this insight:** It’s a myth that STEM activities only interest boys. Although males once dominated fields like math, science, and engineering, the gender gap is closing. In the U.S. in 2019, women accounted for a third (34 percent) of people employed in STEM occupations; however, few (11.6 percent) were women of color (Catalyst, 2022). Women continue to be underrepresented in STEM-related careers, and researchers suggest that confidence, more than ability, may be a factor in the gender difference (Morrison, 2019).

Minority populations are also underrepresented in technical and scientific fields. For example, Blacks or African Americans, Hispanics or Latinos, and American Indians or Alaska Natives are underrepresented in science and engineering (National Science Foundation, 2019). Offering STEM education in afterschool settings allows students who are typically underrepresented in the sciences to experience engaging STEM activities, discover new interests, and consider careers in STEM-related fields (Afterschool Alliance, 2021).

## Discussion Starter: Do you think science, technology, engineering, the arts and mathematics will be more important 10 years from now, or less important compared to now?

**Share this insight:** As our economy has shifted from manufacturing to information and technology, career opportunities have also changed. The Pew Research Center (Funk & Parker, 2018) reports that employment in STEM occupations grew 79 percent between 1990 and 2018, which outpaced overall job growth, and computer jobs increased by 338 percent. The projected median income for STEM occupations in 2032 is more than twice that of non-STEM occupations (U.S. Bureau of Labor Statistics, 2023). Also, there’s a growing recognition that the arts can play an important role in career preparation. For example, an article in the *Journal of Microbiology & Biology Education* (Segarro et al., 2018) describes how the arts can be used to train well-rounded, creative scientists.

## References

Afterschool Alliance. (2021). *This is afterschool STEM: Re-engaging students in an equitable recovery.* <https://afterschoolalliance.org/documents/STEM-Challenge-1pager-2021.pdf>

Catalyst. (2022, Aug. 23). *Women in science, technology, engineering, and mathematics (STEM): Quick take.* <https://www.catalyst.org/research/women-in-science-technology-engineering-and-mathematics-stem/>

Falk, J., & Dierking, L. (2010, Nov.-Dec.). The 95 percent solution. *American Scientist*, *98*:486-493. <https://www.americanscientist.org/article/the-95-percent-solution>

Friedman, L., & Quinn, J. (2006, Feb. 22). Science by stealth. *Education Week*. <https://www.edweek.org/leadership/opinion-science-by-stealth/2006/02>

Funk, C., & Parker, K. (2018). *Diversity in the STEM workforce varies widely across jobs*. Pew Research Center. <https://www.pewsocialtrends.org/2018/01/09/diversity-in-the-stem-workforce-varies-widely-across-jobs/>

Morrison, N. (2019, Feb. 11) It’s belief, not ability, that makes girls think STEM is not for them. *Forbes*. <https://www.forbes.com/sites/nickmorrison/2019/02/11/its-belief-not-ability-that-makes-girls-think-stem-is-not-for-them/#4f8459ca7559>

National Science Foundation, National Center for Science and Engineering Statistics. (2019). *Women, minorities, and persons with disabilities in science and engineering: 2019* (Special Report NSF 19-304). Alexandria, VA: Author. <https://ncses.nsf.gov/pubs/nsf19304/>

Segarro, V. A., Natalizio, B., Falkenberg, C. V., Pulford, S., & Holmes, R. (2018). STEAM: Using the arts to train well-rounded and creative scientists. *Journal of Microbiology & Biology Education*, *19*(1). <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5969448/>

U.S. Bureau of Labor Statistics. (2023). *Table 1.11: Employment in STEM occupations, 2022 and projected 2032.* <https://www.bls.gov/emp/tables/stem-employment.htm>

U.S. Department of Education. (2007). *Doing what works: Encouraging girls in math and science* (Practice Guide)*.* <http://ies.ed.gov/ncee/wwc/PracticeGuide/5>

A white rectangular frame with purple border

Description automatically generated

This resource was developed in 2024 by the Nita M. Lowey 21st Century Community Learning Centers (21stCCLC) National Technical Assistance Center (NTAC), funded under a grant from the U.S. Department of Education (Department) and administered by Synergy Enterprises, Inc. under Cooperative Agreement No. 287E230009 with the Department’s Office of Elementary and Secondary Education. Opinions expressed herein do not necessarily reflect the position or policy of the Department, nor does mention of trade names, commercial products, or organizations imply endorsement by the Department or the federal government. This resource is in the public domain and is available at [21stcclcntac.org](http://www.21stcclcntac.org). Authorization to reproduce it in whole or in part is granted.