

Resources—*Solutions* STEM to STEAM

<http://www.edutopia.org/stem-to-steam-resources>

Whether you are looking for resources on integrating science, technology, engineering, and math or on infusing the arts to transform STEM into STEAM, this curated compilation will help you strategize around different approaches to integrated studies.

<http://www.npr.org/series/4111499/where-science-meets-art>

This South Carolina NPR special series explores the unexpected intersections of art and science.

<http://www.shodor.org/master/>

Interactive tools and simulation environments that enable and encourage exploration and discovery through observation, conjecture, and modeling activities.

<http://www.engineeryourlife.org/>

This guide introduces girls in grades 9-12 to young women engineers and highlights careers.

http://eie.org/sites/default/files/bayer_compendium.pdf

All 38 K-12 STEM programs included in this report provide challenging content/curriculum, an inquiry-learning environment, defined outcomes/assessment, and sustained commitment/community support.

<http://stem.firstbook.org/materials>

Downloadable posters, educator guides with activities and age-appropriate career information for your students. All activities meet national education standards of learning for math, science and technical literacy.

<http://www.stemfinity.com/Free-STEM-Education-Resources>

A host of free STEM resources for students and teachers from Pre-K to high school.

Resources—*Solutions* STEM to STEAM

Alliance for Science & Technology Research in America. (2015). *Telling our story through data: ASTRA's STEM on the Hill state STEM & innovation report cards 2015*. Washington, DC: Author. Retrieved from www.usinnovation.org/state-innovation-vital-signs

Bidwell, A. (2014). Report: STEM job market much larger than previously reported. *US News and World Report*, pp. 1. Retrieved from www.usnews.com/news/stem-solutions/articles/2014/02/05/report-stem-job-market-much-larger-than-previously-reported

Cross, N. (2001). Designerly ways of knowing: Design discipline versus design science. *Design Issues*, 17(3), 49-55. Retrieved from <http://dx.doi.org/10.1162/074793601750357196>

Dede, C., & Richards, J. (Eds.). (2012). *Digital teaching platforms: Customizing classroom learning for each student*. New York, New York: Teachers College Press.

Delaney, M. (2014, April). Schools shift from STEM to STEAM. *EdTech*. Retrieved from www.edtechmagazine.com/k12/article/2014/04/schools-shift-stem-steam

Diamond, B. S., Maerten-Rivera, J., Rohrer, R. E., & Lee, O. (2014). Effectiveness of a curricular and professional development intervention at improving elementary teachers' science content knowledge and student achievement outcomes: Year 1 results. *Journal of Research in Science Teaching*, 51(5), 635-658. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/tea.21148/abstract>

Ertmer, P. A., & Simons, K. D. (2006). Jumping the PBL implementation hurdle: Supporting the efforts of K–12 teachers. *Interdisciplinary Journal of Problem-Based Learning*, 1(1), 5. Retrieved from <http://dx.doi.org/10.7771/1541-5015.1005>

Friedman, L. N. (2013, December 11). How a learning gap grows. *Education Week*. Retrieved from <http://www.edweek.org/ew/articles/2013/12/11/14friedman.h33.html>

Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223-252. Retrieved from <http://dx.doi.org/10.1007/s11423-006-9022-5>

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235-266. Retrieved from <http://dx.doi.org/10.1023/B:EDPR.0000034022.16470.f3>

International Society for Technology in Education. (2007). *Standards for students*. Retrieved from <http://www.iste.org/standards/iste-standards/standards-for-students>

Resources—*Solutions* STEM to STEAM

- Johnson, L., Adams Becker, S., Estrada, V., and Freeman, A. (2015). *NMC horizon report: 2015 K-12 edition*. Austin, Texas: The New Media Consortium. Retrieved from <http://cdn.nmc.org/media/2015-nmc-horizon-report-k12-EN.pdf>
- King, H. (2011). *Connecting in-school and out-of-school learning experiences* (ISE Research Brief). Retrieved from <http://www.relatinresearchtopractice.org/article/229>
- Krajcik, J. (2015). Project-based science. *The Science Teacher*, 82(1), 25. Retrieved from http://dx.doi.org/10.2505/4/tst15_082_01_25
- Lee, K. T., & Nason, R. A. (2013). The recruitment of STEM-talented students into teacher education programs. *International Journal of Engineering Education*, 29(4), 833-838. Retrieved from http://www.ijee.ie/latestissues/Vol29-4/06_ijee2734ns.pdf
- National Science Board. (2014). *Science and engineering indicators 2014*. Arlington VA: National Science Foundation (NSB 14-01). Retrieved from <http://www.nsf.gov/statistics/seind14/>
- Traphagen, K., & Traill, S. (2014). *Report from the field: How cross-sector collaborations are advancing STEM learning*. Los Altos, CA: NOYCE Foundation. Retrieved from <http://www.samueli.org/stemconference/documents/stem%20learning%20ecosystems.pdf>
- Zucker, A. (2015). *Regional education report: A baseline report on public education in the Tri-County Region*. Charleston, SC: Tri-County Cradle to Career Collaborative. Retrieved from www.tricountycradletocareer.org

-end-