



Integrating S.T.E.A.M. Careers into the Classroom

Objectives

Participants will:

- Learn statistics related to the future of S.T.E.A.M. careers.
- Identify overarching concepts for integrating S.T.E.A.M. careers into the classroom.
- Discuss examples of simple methods for integrating S.T.E.A.M. careers into the classroom.
- Gain a general understanding of the sixteen career clusters.

Suggested Grade Level

K – 12th

Subject Areas

All

21st Century Essential Skills

- Critical thinking/Problem solving
- Creativity/imagination
- Collaboration and Teamwork
- Communication
- Carrying out investigations
- Flexibility
- Leadership
- Initiative
- Social Skills
- Constructing Explanations
- Obtaining/Evaluating/Communicating Ideas

Background

S.T.E.M. occupations in the United States are projected to grow by about 9% from 2014 to 2024. Additionally, 80% of future professions will require STEM expertise. By 2022, at least 54% of all employees will require significant re-upskilling and upskilling efforts for employees that are currently in high value roles. 61% of employers have challenges finding qualified experienced talent. By 2030, 85% of current elementary school students will work in professions that do not exist today.

Those statistics really give an understanding of the future and importance of S.T.E.A.M. careers. In order to help prepare our students for careers that don't exist yet, we need to move away from rote learning and into a form of learning where students are problem solving.

All careers can be categorized into sixteen career clusters. Examples of career clusters are Finance, Health Science, and S.T.E.M. (Science, Technology, Engineering, and

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Mathematics). Going further, those 16 career clusters are categorized into six career pathways, which are Human Services, Natural Resources & Agriculture, Business Management & Technology, Arts & Communication, Health Services, and Industrial & Engineering Technology. In the resources section of this lesson, there is a graphic that is a good visual for students and can help with incorporating careers into your classroom.

There are more detailed visuals of the 16 career clusters that actually list out individual occupations with each field. They can be found on the Internet or if you visit your school counselor, they should also have this information.

Vocabulary

Career clusters, career pathways, innovation design space, design- and challenge-based learning

Materials

- Varies

Lesson

1. We have four big ideas for integrating S.T.E.A.M. careers into your classroom.
 - a. The first is to start slowly. Don't try implementing every element of S.T.E.A.M. all at once, meaning don't try to have a lesson that has science, technology, engineering, art, and math careers all tied into it. Rather, choose one element of S.T.E.A.M. and try to focus on that for your first lesson.
 - b. Secondly, and this is probably the easiest, is to try to build a bridge between S.T.E.A.M. lessons and real-world issues.
 - c. The third big idea is the big teaching shift where we want to have students achieve a deeper understanding of problem-solving skills. This relates really well to project-based learning and other forms of investigative learning where students have to solve a real-world problem while also learning new concepts at the same time.
 - d. Our last big idea is to make it matter for students. This is the biggest buy-in for students; if it matters to them then they will be more willing to learn. The awesome part about S.T.E.A.M. careers is that regardless of student interest there is always something that can relate.
2. Some simple examples of ways you can start integrating S.T.E.A.M. careers into the classroom include:
 - a. Inviting speakers and mentors into your classroom
 - b. Have students own their projects where they design, test, improve, etc.
 - c. Junk engineering challenges
 - d. Having an innovation design space in the classroom
 - e. Assigning students classroom jobs that relate to careers they are interested in
 - f. Promoting design- and challenge-based learning
 - g. Incorporating a genius hour into your classroom
 - h. A wonderful way to connect virtually with scientists is an online platform called "Skype A Scientist."

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3. Future research and investigation can be conducted by exploring the “Resources” section below.

Extensions

- Have students research a chosen career and create a presentation about that career.

Resources

- Ascd. (n.d.). NSTA. Retrieved May 27, 2020, from <http://www.ascd.org/ascd-express/vol6/624-metz.aspx>
- Basic image of the 16 career clusters that follow the 6 career pathways. Perfect to use in small group and/or...: Career pathways, Career clusters, Education college. (n.d.). Retrieved May 27, 2020, from <https://www.pinterest.com/pin/205828645448403231/>
- By. (2016, February 8). Where Passions Come Alive. Retrieved May 27, 2020, from <http://geniushour.com/>
- CareerOneStop. (2016, August 19). Retrieved May 27, 2020, from <https://www.careeronestop.org/Videos/CareerVideos/career-videos.aspx>
- Parents And Educators. (n.d.). Retrieved May 27, 2020, from <https://spaceplace.nasa.gov/menu/parents-and-educators/>
- SKYPE A SCIENTIST. (n.d.). Retrieved May 27, 2020, from <https://www.skypeascientist.com/>
- STEAM Teaching Resources for Educators: Resilient Educator. (2020, May 26). Retrieved May 27, 2020, from <https://resilienteducator.com/collections/steam-teaching-resources/>