



5-E CLASSROOM STEM ACTIVITY:
EXPLORING STEM CAREERS:
TRADES, TECH, TRANSPORTATION, AND TOURISM

Ellen Egley
Education Content Manager, STEM Jobs

STEM MYTHS BUSTED



There are a lot of myths out there about STEM careers and the path students should take after high school. These myths are accepted as fact and feed into each other - causing students to miss out on opportunities to do what they love. Let's bust some common STEM myths.

MYTH 2:

Everyone needs to go to college to get a good job.

REALITY:

Everyone needs to get the right training that will allow them to do what they love.

FACTS:

A: Seventy percent of STEM careers require a two-year degree or certification.

B: In a survey by the Alcoa Foundation, 55 percent of respondents thought the average pay for manufacturing employees was \$15 per hour or less. The National Association of Manufacturers (NAM) shows that the average manufacturing worker earned \$26 per hour in 2014.

C: High dropout and transfer rates are often the result of people pursuing a path that isn't right for them.

D: Apprenticeships can lead to a great job with no student loan debt. They allow you to get experience and enter the workforce quickly, with a high starting salary. Many even pay for employees to get continuing education! ☑

5-E CLASSROOM STEM ACTIVITY: EXPLORING STEM CAREERS

Here are some ideas for how middle school teachers could use this story as a launching point for integrated STEM learning. Our activities follow the 5-E Learning Cycle Model.



Part 1: Engage

- ① Take an informal poll in your classroom:
 - a. How many of you feel like you're "supposed" to attend a four-year college?
 - b. How many of you know what you want to do as a career?
 - c. How many of you know the education path that trains you for that career?
 - d. What conclusions can you draw from students' responses?
- ② Have students read "STEM Myths Busted" in the Late Fall 2016 issue of *STEM Jobs* magazine.
 - a. Did anything surprise them?
 - b. What are their thoughts about careers in advanced manufacturing and skilled trades?
 - c. What do they think is the average cost of earning a bachelor's degree at a public (in-state) college? At a private (in-state) college? Do most students finish a degree in four years? If not, how does that affect the cost of getting a degree?



Part 2: Explore

- ① Break students into pairs and assign each pair one of the job spreads that can be found in the magazine or online at edu.STEMjobs.com/teacher-resources. Teacher can determine whether to assign them randomly or based on student interest.
- ② Tell students that each pair will choose one job from their assigned job spread to investigate further. Teacher will monitor selections to avoid duplications. Students will research:
 - a. Duties and Responsibilities**
 - i. What can someone in this career expect to do each day?
 - ii. What skills are used?
 - b. Education Required**
 - i. What type of training is required to be qualified for this career?
 - ii. If formal schooling is required:
 1. Which program provides the best training? (computer science, communication, civil engineering, etc.)
 2. What schools in your area offer this program?
 3. What is the tuition cost for the applicable program at three of these schools?
 4. What is the graduation rate at these three schools?
 5. What is the job placement rate at these three schools?
 6. How long does it take the average student to complete the program at each of these three schools?
 - c. Salary**
 - i. What is the average entry-level salary?
 - ii. What is the median salary?
 - iii. How long will you have to work to recoup tuition costs if you earn the entry-level salary?
The median salary?
 - d. Job Prospects**
 - i. Is there job growth projected for this career?
 - ii. What companies in your area are hiring for this career?
 1. Do they pay for continuing education?
 2. Are there opportunities for advancement and growth?
 3. Do they offer benefits?
 - a. How much do employees pay for health insurance?
 - b. Is there a retirement offering, like a 401K?

Recommended resources can be found at edu.STEMjobs.com/teacher-resources.



Part 3: Explain

- ① Students will create a PowerPoint or Google Slides presentation of their findings to share with the class. Both students in each pair should contribute to both the creation and delivery of the presentation. Pairs will be graded according to the rubric in the Evaluate section, which should be shared with students when the assignment is given.
- ② At the culmination of the presentations, poll students again:
 - a. Did anyone discover a career they never knew existed?
 - b. Did anyone discover a career they would consider pursuing?
 - c. Which career had the lowest education cost?
 - d. Which career had the highest salary?



Part 4: Elaborate

Students will submit a formal writing assignment responding to the following prompt:

What career was the most appealing to you and why?

Was this a career you would have considered previously?

Why or why not?

What courses should you take in high school to prepare you for the career or post-graduate training?



Part 5: Evaluate

Group presentations and individual contributions will be scored according to the following rubric. Individual writing assignments can be graded as desired.

5	4	3	2	1
The presentation was clear, concise, and thorough. It provided precise information and explanations.		The presentation was informative. It answered most of the questions posed in the prompt in an understandable way.		The presentation was unclear and only provided a small portion of the required information.
The student contributed to the group's research, understanding, and presentation in meaningful ways.		The student contributed somewhat to the group's research and/or presentation.		The student did not contribute to the group's research or presentation.

Standards Addressed:

Common Core State Standards - English and Language Arts

CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

CCSS.ELA-LITERACY.W.6.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

CCSS.ELA-LITERACY.W.6.7 Conduct short research projects to answer a question, drawing on several sources and refocusing the inquiry when appropriate.

CCSS.ELA-LITERACY.W.6.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-LITERACY.W.6.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.6.5 Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

CCSS.ELA-LITERACY.W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

CCSS.ELA-LITERACY.W.7.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

CCSS.ELA-LITERACY.W.7.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-LITERACY.SL.7.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

CCSS.ELA-LITERACY.W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

CCSS.ELA-LITERACY.W.8.7 Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

CCSS.ELA-LITERACY.W.8.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

CCSS.ELA-LITERACY.W.8.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

Texas Essential Knowledge and Skills - Career Development

EC.1.D research current and emerging fields related to personal interest areas

EC.1.E determine academic requirements in career fields related to personal interest areas

EC.1.G research educational options and requirements using appropriate technology

EC.3.B explore opportunities for earning college credit in high school such as advanced placement courses, International Baccalaureate courses, dual credit, and local and statewide articulated credit

EC.3.E demonstrate decision-making skills related to school and community issues, programs of study, and career planning

EC.5.B use appropriate resources to compare and contrast salaries and educational requirements of at least three careers in the student's interest area

EC.5.C evaluate at least three career interests based on budget and salary expectations

EC.7.A demonstrate effective verbal, nonverbal, written, and electronic communication skills

CP.1.A identify the various career opportunities within one or more career clusters

CP.1.B identify the pathways within one or more career clusters

CP.2.A investigate career opportunities within the pathways

CP.2.B explore careers of personal interest

CP.2.C research the academic requirements for careers of personal interest

CP.2.D research the certification or educational requirements for careers of personal interest

CP.3.B identify the academic and technical skills needed

Texas Essential Knowledge and Skills - Math

6.14.A compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income

8.12.G estimate the cost of a two-year and four-year college education, including family contribution, and devise a periodic savings plan for accumulating the money needed to contribute to the total cost of attendance for at least the first year of college