Library Resources and Understanding the Focus on STEM

Nebraska State Data Center

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What am I going to learn today?

- What the heck is STEM?
- Why is it always in the news?
- Why should I care about it?
- Where do I find reliable information from the government?

What is STEM?

"STEM" is the acronym for the following areas:

- **S**cience
- **T**echnology
- **E**ngineering
- **M**ath

Who is talking about STEM?

- President Obama
- Government agencies – Depts of Education, Defense, Transportation and others
- National Education Association
- Nebraska State Education Association
- On the news – Fox News, CNN
- Local schools and parents – Common Core
- Youth clubs – 4-H, Girl & Boy Scouts, Academic Decathlon, Destination Imagination, FFA, Science Olympiad, Robotics club

Why is this important now?

Space Race (1955-1972)

- Presidents Eisenhower, Kennedy
- USA wanted to be technologically superior to the Soviet Union
- Based in missile-based arms race following World War II
- Increased spending on education and pure research
- Focused on launching first satellites, then humans into space, then moon landings
- National Defense Education Act (1958) increased funding for a greater emphasis on mathematics and physical sciences in kindergarten through post-grad levels

STEM Race (2006-Present)

- Presidents Bush, Obama
- USA wants to improve global competitiveness in technology development
- Based on building up citizens well versed in STEM fields through public education
- Increased spending on education and pure research
- Focuses on increasing number of skilled workers and education programs in USA
- America COMPETES Act (2007) increased the nation's investment in science and engineering research and in STEM education from kindergarten to post-grad levels

Why should I care about the STEM "Pipeline"?

- In 2010, there were 7.6 million STEM workers in the United States, representing about 1 in 18 workers.
- STEM occupations are projected to grow by 17.0 percent from 2008 to 2018, compared to 9.8 percent growth for non-STEM occupations.
- In 2018, 8.6 MILLION STEM jobs will need to be filled in the US.
- STEM workers command higher wages, earning 26 percent more than their non-STEM counterparts.
- More than two-thirds of STEM workers have at least a college degree, compared to less than one-third of non-STEM workers.
- STEM degree holders enjoy higher earnings, regardless of whether they work in STEM or non-STEM occupations.

http://www.esa.doc.gov/Reports/stem-good-jobs-now-and-future

How do I major in STEM?

Computer and information systems
Computer science
Computer administration management and security
Computer programming and data processing
Information sciences
Computer networking and telecommunications
Electrical engineering technology
Oceanography
Botany
Neuroscience
Physics
Molecular biology

Mathematics
Statistics and decision science
Mathematics and computer science
Applied mathematics
Engineering technologies
Architectural engineering
Materials engineering and materials science
Engineering and industrial management
Biomedical engineering
Mechanical engineering

General engineering
Environmental engineering
Petroleum engineering
Aerospace engineering
Geological and geophysical engineering
Miscellaneous engineering
Biological engineering
Industrial and manufacturing engineering
Chemical engineering
Metallurgical engineering
Cognitive science and biopsychology
Nuclear, industrial radiology, and biological technologies
Ecology

Industrial production technologies
Civil engineering
Mining and mineral engineering
Mechanical engineering related technologies
Computer engineering
Naval architecture and marine engineering
Miscellaneous engineering technologies
Electrical engineering
Nuclear engineering
Military technologies
Engineering mechanics physics and science
Biochemical sciences
Nutrition sciences

Animal sciences
Genetics
Physical sciences
Food science
Microbiology
Astronomy and astrophysics
Plant science and agronomy
Pharmacology
Atmospheric sciences and meteorology
Soil science
Physiology
Chemistry
Environmental science
Zoology
Geology and earth science
Biology
Miscellaneous biology
Geosciences

http://www.esa.doc.gov/sites/default/files/reports/documents/stemfinalyjuly14_1.pdf

I need info on STEM careers.

- **Occupational Outlook Handbook**
  http://www.bls.gov/ooh/
- **STEM Careers at State**
  http://www.state.gov/e/oes/stc/stem/careers/index.htm
- **STEMconnector**
  https://www.stemconnector.org/stemdirectory

Denotes website demonstrated today

I need to know more about STEM degrees.

- National Center for Science and Engineering Statistics http://www.nsf.gov/statistics/
- Science, Technology, Engineering and Math: Education for Global Leadership http://www.ed.gov/stem
- Where do college graduates work? A special focus on Science, Technology, Engineering and Math https://www.census.gov/dataviz/visualizations/stem/stem-html/

I need info on projects linked to the Department of Energy.

SciTech Connect is a portal to free, publicly-available Department of Energy-sponsored R&D results including technical reports, bibliographic citations, journal articles, conference papers, books, multimedia and data information. **SciTech Connect** includes over 2.5 million citations, including citations to 1.4 million journal articles, 364,000 of which have digital object identifiers (DOIs) linking to full-text articles on publishers' websites. SciTech Connect also has over 313,000 full-text DOE sponsored STI reports; most of these are post-1991, but close to 85,000 of the reports were published prior to 1990.

http://www.osti.gov/scitech/

I need info on real-life, honest-to-goodness research projects the government is funding.

- **National Science Foundation** encourages electronic dissemination of its documents. NSF's publications list includes all publications and forms available in electronic format. You can also search for publications and forms by document type, NSF publication or form number, or keyword. http://www.nsf.gov/publications/ods/
- **National Library of Medicine (National Institute of Health) PubMed** comprises more than 23 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher web sites. http://www.ncbi.nlm.nih.gov/pubmed/
- **National Instituted of Environmental Health Services Extramural Research Portfolio** puts Environmental Health Sciences research at your fingertips. A list of current NIEHS research grants can be retrieved by searching on the science code, state, or by entering in any combination of keywords in the following fields: principal investigator, institution name, grant number, project title, and description/abstract. http://tools.niehs.nih.gov/portfolio/

I need info on how my favorite government agency is doing its part to support STEM.

- **U.S. Dept of Education** http://www2.ed.gov/about/inits/ed/green-strides/stem.html
- **U.S. Dept of State** http://www.state.gov/e/oes/stc/stem/index.htm
- **U.S. Dept of Agriculture** http://blogs.usda.gov/tag/stem/
- **US. Dept of Commerce** http://www.commerce.gov/category/tags/stem
- **U.S. Dept of Energy** http://energy.gov/diversity/services/stem-education
- **Centers for Disease Control and Prevention** http://www.cdc.gov/women/stem/index.htm
- Also check out the website of your favorite agency and type "STEM" in the search box.

I don’t know where to look or who to ask, but I need information related to the government.

USA.gov serves as the Federal government's official Internet portal for consumer information, and it serves as a clearinghouse to direct questions to resources at appropriate agencies.

Resources for public use at UNO

Guests on the UNO campus may access the following databases in Criss Library, free of charge, for 3 consecutive hours daily:

- **Proquest Science & Technology:** A group of sixteen different databases in the sciences including cancer research, biological sciences, environmental sciences, MEDLINE, physical education and science and technology dissertations.

- **ProQuest Statistical Abstract of the United States:** Beginning with 2013, ProQuest has published this annual compilation of statistics compiled by both government and private sources. Tables may be downloaded in both PDF and Excel formats.

- **Web of Knowledge:** Unmatched coverage of the sciences, social sciences, and arts & humanities. Journals, books, data and conference proceedings — indexed cover-to-cover, including over 54 million records covering 5,294 publications in 55 disciplines.

Faculty, students and staff have unlimited access to these databases, both on and off campus, with your MavCard. Simply come to the library to activate it.

See http://library.unomaha.edu/ for more details.

I want to talk to you about STEM.

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