Utah

Innovation Vital Signs:™
Utah's Federal R&D and STEM* Jobs Report 2013

There's bipartisan consensus that the U.S. needs to **live within its means, cut the federal deficit — and do it the smart way.**

*STEM =

- **Science** — Biology, Chemistry, Marine Biology, Physics, Science
- **Technology** — Computer / Information Systems, Game Design, Developer, Web / Software Developer
- **Engineering** — Chemical, Civil, Computer, Electrical / Electronics, Photonics, General & Mechanical Engineering
- **Mathematics & Statistics**

If we want our children and grandchildren to have good job opportunities in the future, then as a country we need to make science research & development (R&D) and STEM Education top priorities for federal investments.

Especially in this time of fiscal austerity, we need to make wise investments that create new and high-paying jobs, keep Utah and the U.S. competitive, increase our standard of living and grow private enterprise and entrepreneurship.

Industry — and a healthy private sector economy overall — rely heavily upon federally-supported scientific research. A National Science Foundation (NSF) study found that 73% of the scientific papers cited in commercial patents were funded by taxpayers through the federal government, especially university research operations.[1]

Utah received **$597.9 million in federal R&D contracts in FY 2012, with approximately 590 transactions taking place.**[2] Utah universities and colleges received $293.7 million in federal R&D spending, including grants, in FY 2009.[3]

Key Reports and On-Line Resources

- **The Science-Engineering-Technology Working Group (SETWG) sponsors the annual Congressional Visits Day Program. See www.setcvd.org**
- **Science & Engineering Indicators 2012,** published by the National Science Board, provides a broad base of quantitative information on the U.S. and international science and engineering enterprise. It is created biennially by the National Science Foundation's Division of Science Resources Statistics (SRS) **See www.nsf.gov/statistics/seind12/**
- **Where are the STEM Jobs, Where are the STEM Students 2012-2013?** See **https://store.stemconnector.org/Where-Are-the-STEM-Students_p_8.html**

What's in this 2013 Innovation Vital Signs Report™?

Collapsing Support: Federal R&D outlays as Percentage of Discretionary spending 1962-2008:

Top 5 Recipients of Federal R&D Contracts (not Grants) [2] Performed in Utah FY 2012 (rounded)*

1.	Alliant Techsystems, Inc.	$345,188,832
2.	L-3 Communications Holdings, LLC	$133,908,138
3.	Utah State University	$48,681,578
4.	Jacobs Engineering Group, Inc.	$19,005,074
5.	University of Utah	$13,639,170

** Note: R&D contract & grant amounts do not include management and administrative fees for the operation of Government-Owned, Contractor-Operated (GOCO) facilities under OMB definitions.*

Top 5 Contracting Agencies for Utah R&D Investments During FY 2012 [2]

1.	NASA	$307,747,416
2.	Department of Defense	$262,966,374
3.	Dept. of Health & Human Services	$17,327,972
4.	General Services Administration	$8,166,401
5.	Department of Transportation	$583,984

1. NSF-sponsored study, March 1997; 2 and 3. Sources: The sources of this data include a variety of federal government agencies, including the U.S. Office of Management & Budget and the National Science Foundation.

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101,000 Utah STEM* Jobs to fill for 2018

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101,000 = the number of STEM-related jobs Utah will need to fill by 2018.[1] Utah kids and parents need to know about the potential for rewarding — and high paying careers in STEM. STEM professions and occupations are among the highest paying jobs.

They are also the basis for a successful, globally competitive and innovative Utah and U.S. economy. During the next decade, overall U.S. demand for scientists and engineers is expected to increase at four times the rate for all other occupations.

- Between 2008 and 2018, new jobs in Utah requiring postsecondary education and training will grow by 202,000 while jobs for high school graduates and dropouts will grow by 97,000.
- Between 2008 and 2018, Utah will create 477,000 job vacancies both from new jobs and from job openings due to retirement.
- 308,000 of these job vacancies will be for those with postsecondary credentials, 126,000 for high school graduates and 43,000 for high school dropouts.
- Utah ranks 24th in terms of the proportion of its 2018 jobs that will require a Bachelor's degree, and is 31st in jobs for high school dropouts.

Change in Utah Jobs by Education Level: 2008 and 2018

Educational Level	2008 Jobs	2018 Jobs	Difference
High School Dropouts	124,000	148,000	24,000
High School Graduates	363,000	436,000	73,000
Postsecondary	861,000	1,063,000	202,000

1. ***Source of data:*** Anthony Carnevale, Nicole Smith & Jeff Strohl, Georgetown University Center on Education and the Workforce publication ***Help Wanted: Projections of Jobs and Education Requirements Through 2018.*** **June 2010. See www.cewgeorgetown@georgetown.edu**

Where will Utah's STEM Jobs be in 2018 by Occupation & Educational Level? (in thousands of jobs)

		High School Dropouts	High School Graduates	Some College	Associate's Degree	Bachelor's Degree	Graduate Degree	Total
STEM Jobs	Computer & Mathematical Science	1	4	12	5	21	6	49
	Architects & Technicians	0	0	2	1	2	1	7
	Engineers & Technicians	0	2	4	2	11	6	25
	Life & Physical Scientists	0	1	2	1	6	4	14
	Social Scientists	0	0	1	0	2	3	6
								101,000

Utah

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UT vs. National:

23.2%
of High School Students in Utah are Interested in STEM
Compared to 25.5% Nationally

**STEM =*

Science
Biology, Chemistry, Marine Biology, Physics, Science

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Mathematics & Statistics

Students in Utah are slightly more likely than students nationally to be interested in a Physics major or career.

Male students in Utah are more likely to say they are interested in a Chemistry major or career than male students nationally.

American Indian students in Utah are more interested in a major or career in Mathematics than American Indian students nationally.

African American students in Utah are slightly more likely to say they are interested in a Marine Biology major/career than African American students nationally.

STEM interest in Utah has been lower than the national average for the past 10 years, but may increase among current high school students.

American Indian male STEM interest in Utah has been lower than the national average, but is expected to increase significantly in the classes of 2014 to 2016.

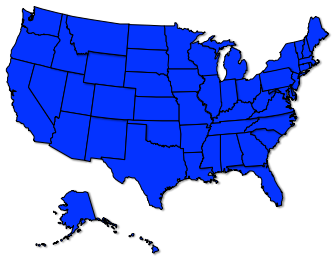
Source: ***Where are the STEM Students? Where are the STEM Jobs? 2012-2013***. My College Options® and STEMconnector®, 2013

Interest of Utah High School Students by STEM Discipline

Discipline	National Average	Utah Average	Utah Male	Utah Female
Science	9.4%	8.7%	9.5%	8.0%
Technology	5.8%	4.9%	9.9%	1.2%
Engineering	11.7%	10.8%	21.9%	2.4%
Mathematics	2.1%	1.9%	2.5%	1.5%

STEM Jobs by State 2018

Where will the STEM Jobs be in 2018 by State?



STEM Jobs will continue to expand as the U.S. economy recovers from the Great Recession. The U.S. Bureau of Labor Statistics estimates that at least **8,654,000 U.S. STEM jobs will exist in 2018 and this does not count self-employed STEM individuals**. It has projected the estimated number of STEM jobs by State. At issue is whether or not the U.S. educational system can produce sufficient new workers to fill such jobs, and if not, what employers can do to find suitable talent.

Projected STEM Jobs Need by State in 2018 and Ranking by Total Number of Jobs

STATE RANK 2018	STATE	PROJECTED 2018 STEM JOBS
23	Alabama	110,000
47	Alaska	20,000
18	Arizona	166,000
36	Arkansas	52,000
1	California	1,148,000
14	Colorado	232,000
22	Connecticut	116,000
41	Delaware.	31,000
27	District of Columbia	94,000
4	Florida	411,000
16	Georgia	211,000
42	Hawaii	29,000
40	Idaho	41,000
6	Illinois	348,000
21	Indiana	123,000
32	Iowa	72,000
30	Kansas	80,000
31	Kentucky	74,000
33	Louisiana	69,000
44	Maine	25,000
13	Maryland	241,000
9	Massachusetts	300,000
10	Michigan	274,000
17	Minnesota	188,000
38	Mississippi	46,000
20	Missouri	143,000

Projected STEM Jobs Need by State in 2018 and Ranking by Total Number of Jobs

STATE RANK 2018	STATE	PROJECTED 2018 STEM JOBS
44	Montana	25,000
37	Nebraska	48,000
34	Nevada	54,000
39	New Hampshire	43,000
12	New Jersey	269,000
35	New Mexico	53,000
3	New York	477,000
15	North Carolina	229,000
51	North Dakota	15,000
11	Ohio	274,000
29	Oklahoma	81,000
24	Oregon	109,000
7	Pennsylvania	314,000
43	Rhode Island	26,000
28	South Carolina	85,000
49	South Dakota	18,000
24	Tennessee	109,000
2	Texas	758,000
26	Utah	101,000
48	Vermont	19,000
5	Virginia	404,000
8	Washington	303,000
44	West Virginia	25,000
19	Wisconsin	155,000
50	Wyoming	16,000
	TOTAL STEM JOBS	8,654,000

Source: U.S. Bureau of Labor Statistics, 2011